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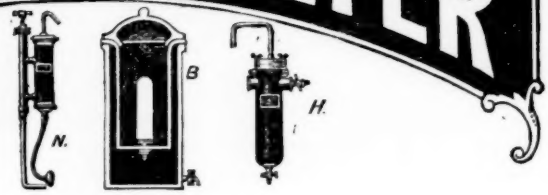


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# An Address
ON
# SPIROCHÆTOSIS ICTEROHÆMORRHAGICA.

*Delivered before the Section of Medicine of the Royal Society of Medicine*

BY MAJOR-GENERAL SIR BERTRAND DAWSON, M.D. LOND., F.R.C.P. LOND., G.C.V.O., C.B.,
ARMY MEDICAL SERVICE; PHYSICIAN-IN-ORDINARY TO H.M. THE KING; PHYSICIAN TO THE LONDON HOSPITAL.

THE spirochætes form a large group of unicellular organisms, most of which are harmless saprophytes, and are commonly found in the various genera of shell fish. Those proved to be pathogenic are few, though increasing in number, and belong to the smaller forms. It seems to be established that they multiply by longitudinal or transverse division, but conjugation has not been established. The spirochæte of tick fever has been shown by Leishman to give rise to coccoid forms which appear to be able to produce the disease, and resembling, it may be, in their attributes bacterial spores. Whether spirochætes belong to the vegetable or animal kingdom—whether they are bacteria or protozoa—is a question of academic interest for determining which criteria appear to be lacking.

## DESCRIPTION OF ORGANISM: CULTIVATION AND AGGLUTINATION.

*Spirochæta icterohæmorrhagiæ*, discovered by Inada and Ido in 1914. The organism varies in length from 4$\mu$ to 25$\mu$ with an average of 8$\mu$ to 9$\mu$. The ends are sharp and pointed, and in many cases hooked. Martin, Pettit, and Vaudremer have described flagella, terminally placed, and of varying length and ending in circular knobs, the significance of which is unknown. (Fig. 1.) The organism shows irregular undulations, usually composed of two to three large, or four to five smaller, waves. (Fig. 2.) Rarely forms in which the waves are more numerous and regular occur, thus resembling *T. pallidum*. Other variations in shape are met with: round or oblong granules, three or four in number, may appear within some forms.

*Cultivation.—S. icterohæmorrhagiæ* was first cultivated by Ito and Matsuzaki, who employed the method of Noguchi, guinea-pig kidney replacing that of the rabbit usually employed. The cultures were made from the blood or liver-

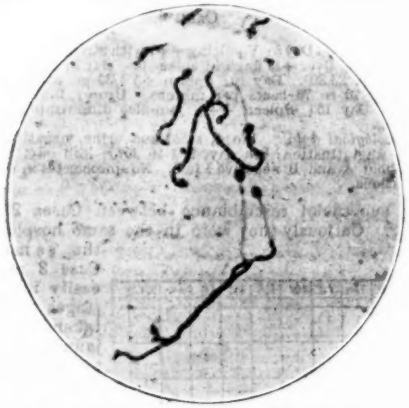


FIG. 1.—*Spirochæta icterohæmorrhagiæ* (Pettit).

pulp of an infected guinea-pig, and incubated at a temperature of 22°–25° C. They noticed that growth commenced as a rule in from three to seven days, and that the first generation lived from three to six weeks, the lives of succeeding generations being rather shorter. These same workers have since shown that this spirochæte can be grown in various media, liquid and solid—blood agar and gelatin, human serum, diluted ox serum, and ascitic fluid.

Martin and Pettit advise the use of diluted rabbit serum (1 in 5 of normal saline) or diluted ox serum (1 in 9 of normal saline). The medium is covered with a layer of sterile paraffin and no tissue is added. The optimum temperature is about 27° C., but growth occurs at temperatures varying between 22° C. and 32° C. Growth is at its height about the tenth day in primary culture, and at the fourth to sixth day in subsequent subcultures, and usually at the end of three weeks the culture is dead. Subcultures should be made at the height of growth by the inoculation of fresh tubes of media with 0·5 c.cm. of the living cultures. No growth, or only a feeble growth, occurs in the presence of contamination.

The organism has considerable vitality and will remain active in tap-water exposed to wintry weather for many days,

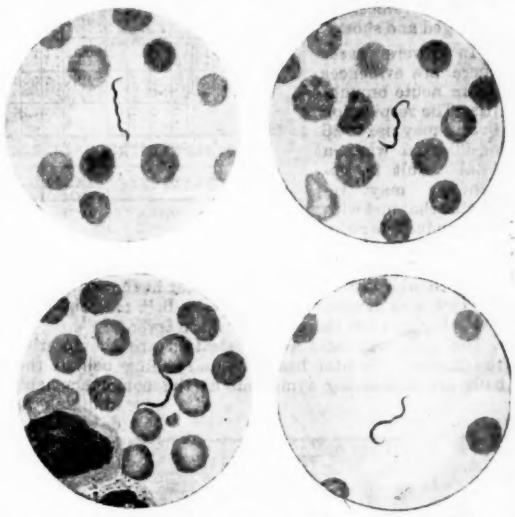


FIG. 2.—*Spirochæta icterohæmorrhagiæ* in blood of guinea-pig experimentally infected (Bedson).

but it has a curious way of suddenly dying out under good conditions and without any apparent reason.

*Agglutination.*—It was noted by Martin and Pettit, during the course of their work on the preparation of an antiserum for spirochætal jaundice, that this antiserum was capable of agglutinating the spirochætes. The antiserum therefore possessed, in addition to the spirochæticidal immune bodies, a specific agglutinin. In view of this fact they examined the sera of convalescents for the presence of agglutinins, and were able to show that here also the sera possessed the power of clumping the spirochætes. Since it is possible to grow this spirochæte with comparative ease, we are now in possession of an additional diagnostic test of value.

The cultures used must be at the height of growth and must show no clumping of spirochætes. Unless the culture be very rich macroscopic agglutination is not obtained; the test therefore has to be done microscopically with the aid of a dark-ground condenser. Martin and Pettit have shown that this agglutinating power of the sera of convalescents may rise to a titre of 1 in 500 or 600, whilst normal sera and the sera of syphilitics are without effect on the spirochæte. These agglutinins appear in the blood about the third week of the disease, at the same time as the other immune bodies.

## CLINICAL MANIFESTATIONS.

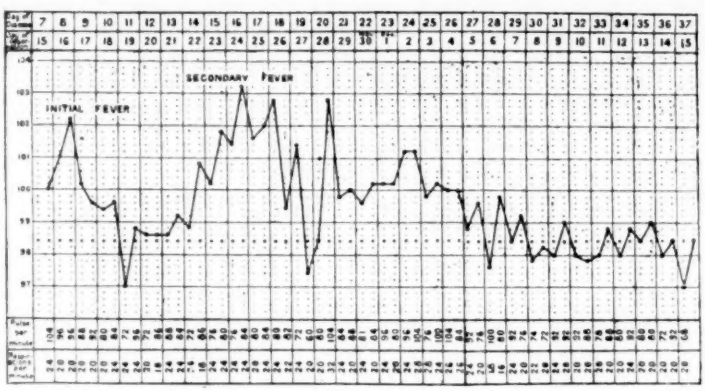
The disease has more often a sudden than a gradual onset, and manifests itself by shivering, head and body pains, great prostration, vomiting, and diarrhœa. The temperature rises quickly to 102° F. or higher. During the succeeding three or four days the conjunctivæ become injected, and herpes, which is liable to become hæmorrhagic, appears on the lips in about 40 per cent. of the patients. Bleeding occurs in most of the severe cases, but uncommonly in the mild ones. It may come from the nose, lungs, stomach, bowel, or as a purpuric rash. Early in the illness a slight hæmoptysis is a valuable diagnostic sign. It is to be noted that hæmorrhage often precedes jaundice in order of appearance.

The jaundice usually appears on the fourth or fifth day, but may be as early as the second and as late as the seventh day. It reaches its height about the tenth to twelfth day. In some cases it is intense, and the skin takes the greenish hue met with in complete obstruction of the common bile-duct. Constipation is marked. The stools may become clay-coloured, though in most cases a small quantity of bile gives them a light brown colouration. Tenderness in the upper abdomen is

usual. The tongue is furred and brown. The liver is frequently enlarged to the extent of two or three fingers below the costal margin. The spleen is not palpable. The gland is in the axillæ and groins are sometimes enlarged and shotty.

In severe cases there are evidences of an acute bronchitis. The respiration in rate may rise to 28 or 30, and when a fatal result is impending may resemble that met with in uræmia. The pulse is slow in proportion to the pyrexia, a rate of 75–85 being quite usual. In this respect the disease resembles enteric fever, though differing from the latter in that the heart does not lock with atropine. The systolic B.P. is about 120 mm., being higher than the B.P. of enteric fever.

The early weakness and prostration are characteristic of the disease. Frontal headache and aching behind the eyeballs are distressing symptoms at the commencement, but diminish as the days pass. The muscular pains last longer, and are at times intense. Twitchings and convulsions may precede or accompany the coma of the fatal cases.



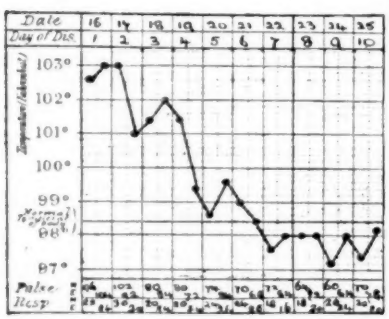

CASE 1.

CASE 1 (see chart).—Aged 38. Onset sudden, with vomiting. Day 3: Dark urine. Day 4: Drowsy; ill; reported sick. Day 7: Brown tongue: jaundice ++; epigastric tenderness. Liver + two fingers; spleen 0. Urine: albumin, bile, casts. Stools contained some bile. Blood: R.B.C. 5,200,000; W.B.C. 13,000. Day 7 to 18: Toxic; jaundice ++. Day 19: Gall-bladder drained (operation). Day 22: Jaundice less; condition improved. Day 32: Convalescent.

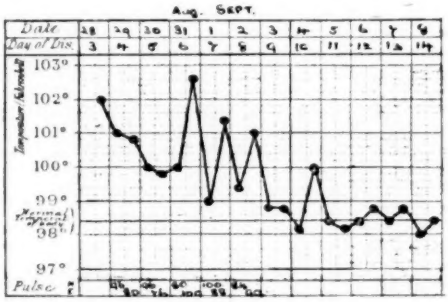
Not all cases of this disease conform to the foregoing picture; many are mild and less defined in their manifestations, and therefore more difficult of detection.

CASE 2. *Spirochætosis (mild)* (see chart).—Sudden onset; pains head and body; vomiting. Day 6: Suffusion of conjunctivæ; slight jaundice; liver 0; spleen 0. Day 9: Jaundice ++; drowsy. Day 10: Condition improving. 1/30 gr. atropine increased heart from 60 to 90 beats per minute. W.B.C. 8500. Day 12: Typical spirochætes found in urine.

CASE 3. *Enteric jaundice* (inoculated against "T"). (See chart).—Sudden onset; lassitude ++; headache. Day 2: Generalised pains.



CASE 2.




CASE 4.

The urine contains bile in abundance, which may persist for four to five weeks. Albumin is usually present, and may reach a sixth; casts—hyaline, epithelial, and granular—are common. Some French authors lay stress on the evidences of renal insufficiency.

The course of the illness varies with the severity of the disease. In the acute case an irregular type of pyrexia persists for 10 to 14 days, and ends by lysis. In some instances there is a secondary rise of fever about the beginning of the third week, which is difficult to explain, since there is no accompanying exacerbation of symptoms or increase of jaundice. The jaundice will reach its height about the tenth day, and this often coincides with the fall of the temperature. In other cases the temperature will fall earlier, while the jaundice is still deepening. Convalescence is slow, but recovery is complete.

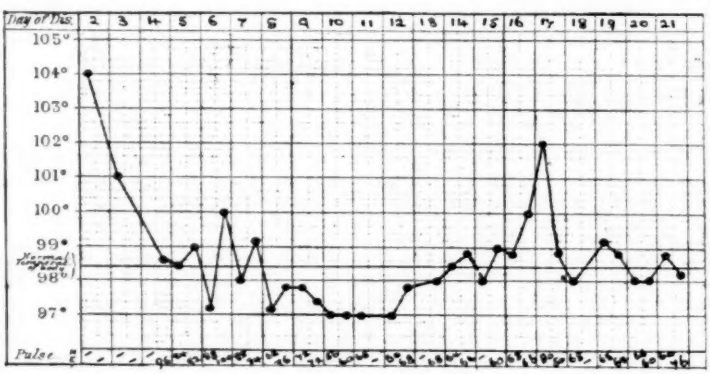
Day 4: Jaundice. Day 5: Vomiting ++, with streaks of blood. Day 6: Jaundice ++; liver + 3 fingers; spleen 0. Day 8: Apathy; jaundice ++; W.B.C. 23,800. Day 10: Spleen +; 1/30 gr. atropine increased heart from 70 to 76 beats per minute. Urine: Bile +; casts; no albumin. Day 15: Spleen ++; jaundice diminishing. Condition improving.

*Bacteriological data:* Blood, stool and urine, negative to enteric group. Agglutination: 8th day, T. 1 in 3675; 16th day, T. 1 in 2822. Paratyphoid A and B negative 1 in 5. No spirochætes in urine in two examinations.

The superficial resemblance between Cases 2 and 3 is striking. Curiously they were in the same hospital and at the same time. Case 3 might so easily in the early stages have been taken for catarrhal jaundice, suggesting to us again how often the latter diagnosis has disguised enteric fever. The acute onset in this case is no unusual occurrence, for the acute onsets of enteric have been as frequent as the gradual ones. Apart from the bacteriological evidence the contrasts lie in the spleens, the conjunctival suffusion

## ILLUSTRATIVE CASES.

The following cases illustrate various types of the disease and show how the brunt of the morbid process does not always fall on the same organs.

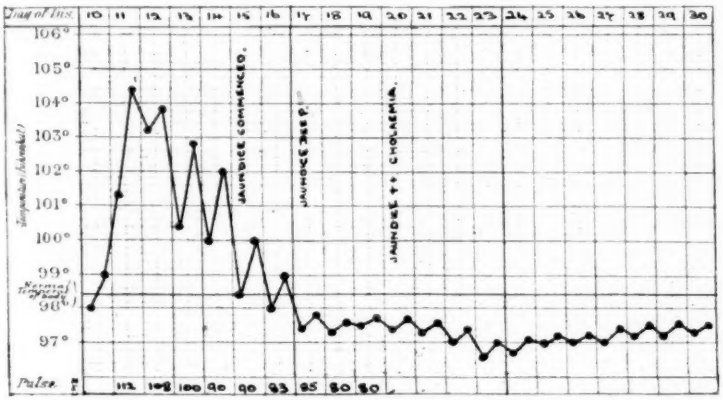


CASE 3.

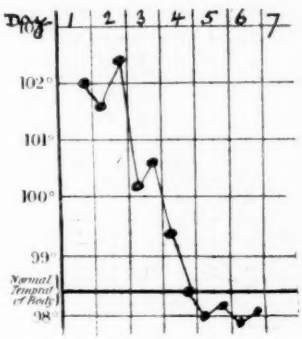
and the atropine reactions. It might be urged that the W.B.C. in Case 3 should have been decreased, but in our experience leucopenia in enteric is by no means a constant feature.

*Spirochætosis without jaundice.*—Cases 4 and 5 illustrate this variety.

CASE 4 (see chart).—Onset sudden; feverish; generalised pains; lassitude +, giddiness. Day 3: Cough; herpes labialis. Day 4: Spirochætes in blood; pains continue. Day 10: Patient improving. Day 14: Typical spirochætes in urine.




CASE 6.




CASE 9.

CASE 5. (*No jaundice.*)—Sudden onset; headache; body pains; photophobia; vomiting. Day 1: T. 104·2°; patient very ill. Days 2-5: Conjunctival suffusion; herpes labialis; vomiting +; no hæmorrhages. Day 14: Convalescence. Day 20: Relapse of fever and pains.

Inoculated guinea-pig developed jaundice. Spirochætes in patient's urine until the end of the ninth week.

CASE 6. *Nephritis in association with jaundice.* (See chart.)—Onset and early days: Body pains; mild headache; transient œdema. Urine: albumin and blood. Day 10: Looked ill. Urine: albumin, blood and casts. Day 11; Fever; urine as before. Day 15: Jaundice faint. Day 17: Jaundice deep. Urine: blood 0; albumin, trace. Days 17 to 33: Weak; wasted; drowsy; cholæmic. Picture resembled spirochætosis. Slow recovery.

Bacteriological data: Enteric negative. Typical spirochætes in urine on three occasions.

The interesting question arises, Did spirochætal infection happen to follow close on the heels of trench nephritis or did it cause the whole illness? The latter would seem to be the more probable explanation, the spirochætal infection first falling on the kidney and later attacking the duodenum or liver and thus producing the more usual clinical manifestations. The pathological findings in the kidneys are sometimes in keeping with a nephritis having existed during life.

Cases 7, 8, and 9 illustrate severe forms of the disease ending in death.

CASE 7.—Onset: Vomiting; pains in leg; fever. Day 3: Hæmatemesis (½ pint). Day 4: Ill; drowsy. Day 7: Jaundice rapidly ++. Day 10: Jaundice +++; abdominal distension; slight cough; bloody sputum. Liver + 3 fingers; spleen 0. Urine: Bile +; albumin +; no casts. Stools clay. R.B.C. 3,000,000; W.B.C. 20,000. Day 14: Drowsy; weak. Day 20: Temperature normal; jaundice less. Days 22 to 29: Drowsiness ++; picture of diabetic coma; jaundice diminishing; general clonic convulsions on 27th day; death in coma.

CASE 8.—Onset acute; pains; repeated vomiting; very ill; vomiting continued till the 14th day. Jaundice appeared 5th day. Liver + 2 fingers; spleen 0. Urine: Albumin trace; casts ++. Stools almost clay-coloured. Blood: W.B.C. 22,500. Drowsy throughout; died on 14th day from toxæmia.

CASE 9 (see chart).—Onset: Head and body pains, weakness, chilliness. Temperature 102°. Days 2 and 3: Repeated vomiting. Day 3: Herpes labialis; jaundice. Day 4: Temperature normal; jaundice markedly increased; liver and spleen not palpable; patient much worse. Day 5: Hæmatemesis; albumin ++, epithelial and erythrocytic casts, no spirochætes; dry brown tongue; tonic convulsions; general condition grave. Day 6 and onwards: Epistaxis, hæmatemesis, melæna, purpura. Guinea-pig inoculated seventh day; negative. Day 12: Death from toxæmia and anæmia. Urine contained characteristic spirochætes.

## PATHOLOGY.

I will pass at once to the morbid appearances of the two last cases, Nos. 8 and 9.

The mucous membrane of the duodenum was very œdematous and congested, its colour resembling a dark-blue plum. Round the orifice of the bile-duct was an area about the size of a florin, slightly raised above the level of the surrounding mucous membrane, and red and injected. In the centre of this area was the ampulla, swollen and congested. The above features were seen, though in a less degree, in the stomach and first three feet of the jejunum. The rest of the intestines was normal in appearance. At the edge of the lesser omentum and about the bile-ducts were numerous enlarged lymph-glands. The normal appearance of the common bile-duct formed a sharp contrast to the duodenum. The last portions of the pancreatic and common bile-ducts were laid open. These also were of normal appearances, except the termination in the ampulla of Vater, which was swollen, congested, and blue.

In Case 9 a probe passed along the common duct (before the latter was opened) into the duodenum dislodged a formed plug which was impacted in the ampulla. A film made from this plug showed numerous epithelial cell nuclei embedded in a matrix of mucin. The structure of the ampulla with the plicated arrangement of the mucous membrane within its lumen favours such impaction and obstruction, as Fig. 3 shows. That an inflammation of the duodenum exists is further borne out by the results of duodenal intubation. On numerous occasions the withdrawn duodenal contents showed the presence of polymorphonuclear leucocytes and large mononuclear cells, which were obviously the result of local inflammation.

It would seem to be clear, therefore, that in some instances the spirochætal infection localises in the duodenum.

*The liver* in each of Cases 7, 8, and 9 showed to the naked eye only insignificant or slight changes. It was nearly normal in size; its cut section was of a greenish hue and firm in texture. In each the gall-bladder was normal in size and appearance.

On microscopic examination the liver cells in Cases 7 and 8 were natural in appearance and arrangement, the lobules were clearly defined, and, apart from biliary stasis, the only abnormal feature was collections of cells in the portal areas, such as occur in many diseases. (Figs. 4, A and B.)

Case 9 shows slight though definite changes in the liver. There is some loss of lobular pattern; the hepatic cells here and there show undue variation in size and shape, or their nuclei are large or multiple; a few mitotic figures are to be seen in the cells, and vacuolation of the cytoplasm can be observed. (Fig. 5.) In scrapings from the liver one definite spirochæte was seen.

In contrast to the foregoing there are cases in which the duodenum shows no notable change, and the liver, though not presenting any marked morbid appearance to the naked eye, shows definite changes on microscopic section. In Fig. 6 the liver cells are dissociated, many are markedly enlarged, with well-stained nuclei. Other cells contain two nuclei, and mitoses are numerous. In the centres of the lobules the cells are less well defined, stain imperfectly, and show slight granular changes. These changes suggest the effect of damage which has been insufficient to produce extensive necrosis, but has acted as a stimulus to cell growth. They somewhat resemble what is seen in subacute yellow atrophy

The next example came from an acute case of only a few days' course. It shows a liver that is the seat of advanced changes, both naked-eye and microscopic. It is diminished in size, its capsule is wrinkled, and in section there are loss of lobular pattern and numerous yellow areas of necrosis. Here complete destruction of liver cells may be seen, the framework of interstitial tissue only being left. Elsewhere in the section groups of hepatic cells show evidence of reaction—double nuclei and mitotic figures. Some large mononuclear cells are seen loaded with bile-pigment, and there is polymorphonuclear infiltration. The endothelial lining of the bile-capillaries seems to be healthy. (Fig. 7.)

Hart describes his own observations with those of Pick and other German workers. He bears out the earlier observations in the British Army, that the disease falls with varying force on the liver, the changes showing gradations between the slightest deviation from normal structure and an extreme disorganisation indistinguishable from acute yellow atrophy.

He further quotes an autopsy of a case which lived three months, illustrating the later anatomical changes following disorganisation of the liver. This liver had an irregular surface, lobular structure was lost, only islands of liver-

FIG. 3.—Section of ampulla of Vater. *a*, folds within lumen of ampulla; *b*, mucous membrane of ampulla; *c*, crypts; *d*, submucous coat.

tissue remained, and there was an extensive fibro-nuclear infiltration round these islands—in other words, anatomically cirrhosis had supervened on acute yellow atrophy.

*Other organs.*—The changes in the kidneys likewise vary, though not to the same extent as those in the liver. In one case the appearances are merely those of cloudy swelling; in another there is inter- and intra-tubular infiltration with polymorphonuclear leucocytes (Fig. 8); while in another (Fig. 9) there are, in addition, hæmorrhages in the glomeruli causing disruption of cells; the protoplasm of the tubular cells stains badly, has a granular appearance, and shows vacuolation—in short, the process approaches necrosis.

The spleen and pancreas show no departure from the normal, but peritoneal, sub-pleural and sub-pericardial hæmorrhages are common. Hæmorrhages are found in the substance of the lung, and in some instances reach the size and consistency of those met with in mitral stenosis.

### PRESENCE OR ABSENCE OF JAUNDICE.

It is clear, therefore, that whether judged from clinical manifestations or pathological appearances not always the same organs receive the brunt of this infection, a fact with which we are familiar in other diseases, notably another spirochætal infection—viz., syphilis. The duodenum and

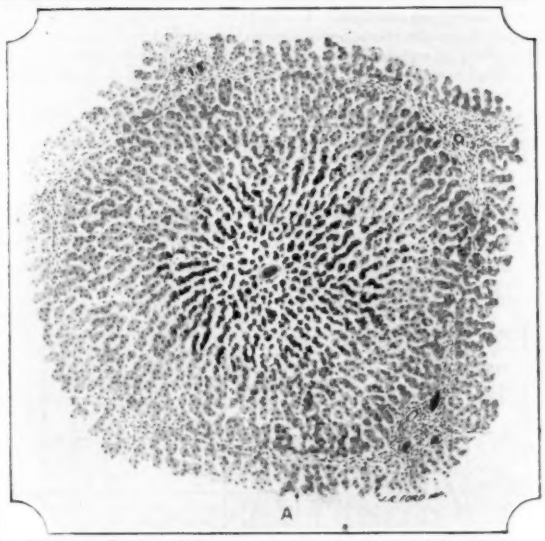



FIG. 4 A.—Section of liver from a case of spirochætal jaundice.

the liver are frequently selected, and as a result jaundice is a common feature.

What then is the immediate cause of the presence or absence of jaundice? Where there are inflammation and swelling of the duodenum and the papilla of Vater and no changes within the liver except bile stasis it is caused by obstruction of the outlet of the common duct. Where there is disorganisation of the lobules, with damage to the cells and intrahepatic ducts, the jaundice is caused by interference with the drainage of the bile within the liver. Where there are no definite changes in the liver and no swelling of the duodenum, jaundice is absent. Repeated examinations of blood have been made to make sure that the jaundice was not due to over-production of bile, but there has never been any evidence of blood destruction, and in two cases in which it was tested the blood fragility was normal in one and decreased in the other.

A comparison between acute yellow atrophy and spirochætosis icterohæmorrhagica is worthy of attention. On the pathological side two of the illustrations I have shown manifest a striking resemblance to acute and subacute yellow atrophy. On the clinical side acute yellow atrophy,

FIG. 4 B.—Part of the same section more highly magnified. The liver cells and their arrangement appear normal. Biliary stasis is evident.

though usually running a rapid course, may extend to 14 or more days' illness. Again, in the wards the clinical picture has often been that of acute yellow atrophy, and yet there have been no characteristic changes in the liver after death, and we get out of the difficulty by calling these cases "icterus gravis." Further, Rolleston records the following case of acute yellow atrophy without jaundice.

Onset sudden, with pain and slight hæmatemesis. On second and third days hæmatemesis, and on following three days melæna. On second day liver dullness was diminished. The temperature was usually between 99° and 100° F. No jaundice. The patient became progressively weaker and drowsy, and died on the eighteenth day. Post mortem the liver showed acute yellow atrophy.

I do not suggest that acute yellow atrophy as we have known it is due to this spirochæte; rather, that what we style in the post-mortem room acute yellow atrophy is the fullest anatomical expression of a destructive process of which there are several grades, and which may be caused by several agencies, *Spirochæta icterohæmorrhagiæ* amongst them.

### THE DISEASE IN THE GUINEA-PIG.

Now we will deflect for a moment to the disease in the guinea-pig in so far as it bears on the human problem. The guinea-pig, the mouse, the rat, and the rabbit are all prone to the disease, and of these the guinea-pig is the most susceptible. In the guinea-pig the disease incubates for 6 to 13 days; its manifestations comprise fever (103° F. or higher), conjunctival congestion, hæmorrhages, jaundice, and albuminuria. The jaundice appears when the temperature has reached its maximum, the animal then becomes more acutely ill, and 24 hours after its appearance there is a fall of temperature to subnormal, followed by collapse and

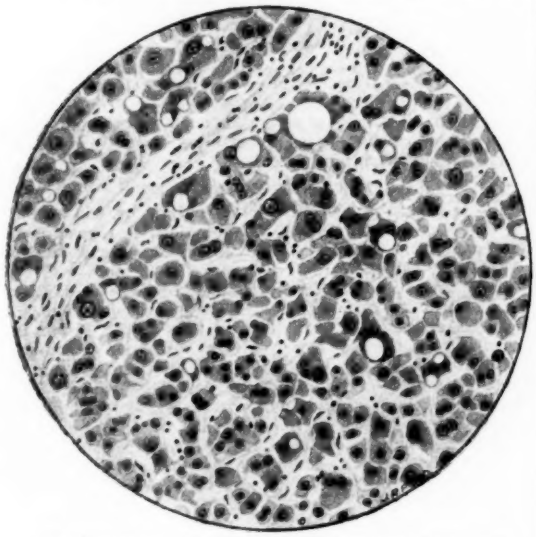


FIG. 5.—Section of liver from Case 9 showing slight changes.

death. Spirochætes appear in the blood with the onset of fever, and appear in the urine soon afterwards. The jaundice is usually deep, though in some cases it is faint, and occasionally absent.

The pathological changes in the guinea-pig are very characteristic. The skin and internal surfaces are coloured yellow, hæmorrhages are widespread in the skin, alveolar tissues, muscles, under serous membranes, and in the post-peritoneal tissues in the region of the kidneys. The lymph glands are enlarged and frequently hæmorrhagic. The small bowel is usually congested and may show numerous hæmorrhages under its serous coat. In some instances the mucous membrane of the duodenum has been more congested and swollen than that of the rest of the bowel. Hæmorrhages occur prior to the jaundice. The liver to the naked eye appears natural. Microscopically the changes vary from cloudy swelling to acute parenchymatous degeneration, small areas of necrosis being found in the section. The kidneys are acutely congested and show minute hæmorrhages subcapsular and throughout the cortex. Microscopically the changes are those of parenchymatous nephritis. The tubular epithelium often shows degenerative changes, and there is a leucocytic infiltration around and in the tubules. The suprarenals are usually hæmorrhagic, as is prone to be the case in any toxæmia in the guinea-pig. On the surfaces of the lungs are hæmorrhages so arranged as to give the lungs the appearance of "the wings of a mottled butterfly." The heart shows nothing, except that it may be the site of small hæmorrhages.

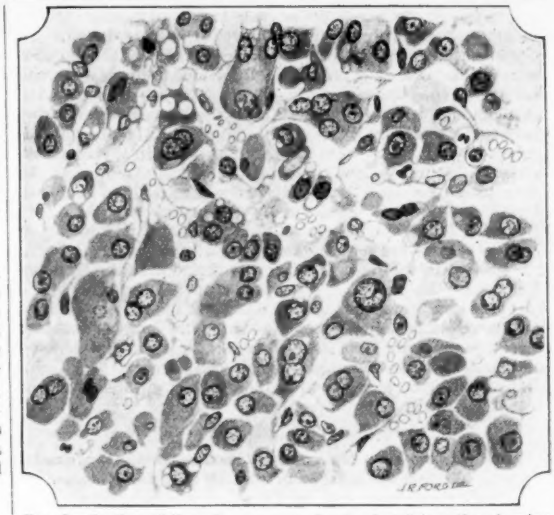


FIG. 6.—Section of liver from a case of spirochætal jaundice showing dissociation of cells and marked degenerative changes.

Whereas the spirochæte is found with difficulty in man, it is abundantly present in the guinea-pig. It is found with ease in the blood of the jaundiced animal and in its liver; a smear from the latter will show a dozen or more spirochætes per oil immersion field. In the kidneys and suprarenals the spirochætes are also plentiful, though patchy in their distribution. They are numerous in the urine from the onset of the jaundice. The spirochætes are excreted in the urine, fæces, and bile, all three of which are infective for the guinea-pig (and would be for man), and especially the bile, notwithstanding the fact that the Japanese workers have failed to demonstrate the spirochæte in the bile.

The disease is best conveyed to the guinea-pig by the intraperitoneal injection of 3 to 5 c.cm. of blood, either from an infected guinea-pig or human, though in the case of the latter the infectivity is limited to the first few days of the illness. As regards the infectivity of the urine there is difference of opinion. The Japanese workers found the

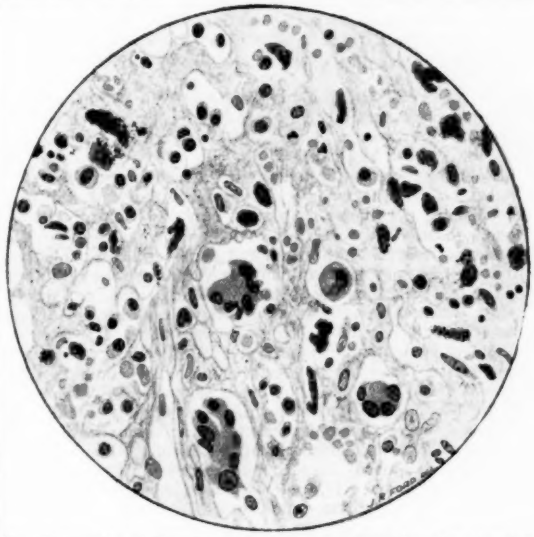


FIG. 7.—Section of liver from a case of spirochætal jaundice showing extreme degrees of change.

patient's urine infectious for guinea-pigs, and so did the French, whereas Stokes and ourselves failed in a limited number of efforts to convey the disease in this manner.

### SOURCE OF INFECTION IN MAN.

By what means do human beings become infected? As was first pointed out by the Japanese workers, this spirochæte is found in the kidneys and urine of rats. If either

the urine or an emulsion of the kidneys of such rats be inoculated into guinea-pigs the disease is reproduced. The organism is found in rats away from, as well as in, areas where this jaundice prevails. Rats act, then, as reservoirs for these spirochætes. Probably the disease was primarily rife amongst these rodents, and the latter have slowly acquired tolerance. Noguchi has recently shown that American wild rats contain this organism in their kidneys, and by immunisation experiments has proved that the American, Japanese, and Flanders strains are identical. Coles, in the course of an investigation on 100 rats in England, found *Spirochæta icterohæmorrhagiæ* in 9 instances.

It is easy to see how the infected urine of rats can convey the disease by fouling the water and the food in the trenches. Nearly all the cases in Flanders occur in men who are, or recently have been, in the trenches, and the disease is more prone to occur in wet trenches than dry ones. Moreover, infection appeared to be endemic; thus, if an infected detachment was removed from the trench the cases diminished, whereas if a new detachment entered the same trench cases began to appear in it.

### DIAGNOSIS.

The evidence as to the cause of this disease would appear to be complete and the method of transmission fairly assured.

1. This spirochæte can be found in the peripheral blood stream of patients suffering from the disease.

2. Injection of infected human blood into the peritoneal cavity of the guinea-pig will produce a characteristic fatal illness in that animal, in whose tissues the spirochætes are present in large numbers.

3. The spirochæte has been isolated in pure culture, and inoculated from such culture the guinea-pig contracts the disease.

4. The disease has been produced in man by accidental inoculation from an infected guinea-pig.

5. After the first fortnight of the disease the spirochæte may be found in the patient's urine, and in the third week of the disease the patient's serum agglutinates the spirochæte.

The difficulty in diagnosis lies in the fact that in the early stages the symptoms may only be those common to several diseases. Enteric fever, trench fever, influenza, and other fevers may show the same initial symptoms. The occurrence of hæmorrhages would certainly suggest spirochætosis; the same would be true, though in less degree, of conjunctival suffusion and herpes. Both of these may also occur in trench fever, though the herpes in the latter is not hæmorrhagic. By the time that there is suspicion of spirochætosis it may be too late to ensure a positive result from the inoculation of a guinea-pig.

The blood of the patient suffering from spirochætosis is only infective during the early stages of the disease. After the fifth day the chances of a positive result diminish, and after the eighth day are few.

Since the average day of appearance of jaundice is the fourth or fifth, it is easy to see that the opportunity of inoculating a guinea-pig in time may easily slip. Though, therefore, this diagnostic test is conclusive, it has in practice its limitations. In mild cases and non-jaundiced cases these limitations are even greater, for in the former the infectivity of the patient's blood is of more brief duration, and in the latter the manifestations suggesting the presence of this disease would often be too late in appearing.

The disease may also be conveyed to the guinea-pig by inoculation from the patient's urine. The centrifugalised deposit from 40–60 c.cm. of urine suspended in 5 c.cm. of normal saline solution is the injection employed. Garnier and Reilly have shown that positive results may be obtained from such urine inoculations after the blood has ceased to be infective and as late in one recorded instance as the twenty-eighth day. If, then, it is too late for blood inoculation, or the latter has failed, urine inoculation should be tried, but with only modest expectation of success.

Direct examination of the blood is of small value because the spirochætes are only present in the circulation during the first days of the disease, and then only in scanty numbers. The organisms are, however, sometimes found, and smears stained by Fontana, Giemsa, or Leishman are worth making.

In practice if the guinea-pig inoculated with the patient's blood is negative and the inoculation were not done early enough to justify the acceptance of a negative diagnosis there has to be a delay of several days before other examinations can be fruitful. These are examinations of the patient's urine and agglutination tests.

FIG. 8.—Section of kidney from a case of spirochætal jaundice showing cloudy swelling as well as inter- and intra-tubular polymorphonuclear infiltration.

### SPIROCHÆTES IN THE URINE.

The spirochætes are eliminated chiefly by the kidney. They appear in the urine about the ninth day, reach their maximum about the fifteenth day, and disappear at the end of the fifth week.

Collect the urine in a sterile vessel, centrifuge 50 c.cm. of it, wash the deposit with sterile water, re-centrifuge and make smears with the final deposit, stain by the Indian ink or collargol method, or better still by the method of Fontana. This method needs practice both in its technique and in the identification of the typical spirochæte. The urine should be examined on two or three occasions. If, as often happens, it has been too late either to perform or to draw inferences from inoculation of a guinea-pig, the demonstration of spirochætes in the urine at a later stage is evidence of considerable value, though less convincing than the reproduction of the disease in an animal.

The significance of spirochætes in the urine has given rise to some discussion. It may be asked, Are not spirochætes found in the urine in other conditions besides this disease? Can the specific spirochæte be morphologically distinguished from other spirochætes?

It is known that spirochætes are found in the urethra and about the meatus. These can be excluded by adopting precautions in the collection of the urine. Stoddard examined 50 patients who had no recent history of a relapsing fever and 50 healthy soldiers. He made smears of the material taken from the meatus and distal urethra. He found spirochætes in 50 per cent. of the former series and in 22 per cent. of the latter series. It is admitted that spirochætes are found in the urethra and round the meatus, though other observers do not find them with the frequency of Stoddard's figures. These spirochætes are thick, have a varying number of regular coils, and do not show morphological resemblance to the spirochæte of this disease.

In examining control urines (collected with the usual precautions) from cases of scarlet fever, measles, lobar pneumonia, enteric fever, &c., Bedson, in my laboratory, only rarely found this thick spirochæte with the regular coils which belongs to the meatus and adjacent urethra.

This observation is confirmed by J. A. Wilson, who, while microscopically examining catheter specimens of urine from 90 cases of albuminuria, only found spirochætes in 6 cases, and these were of the urethral type. It must be admitted, however, that these 90 cases were afebrile.

It is also confirmed by Flessinger, who in view of Stoddard's observations undertook the examination of 93 men: 45 were well and 48 ill. Of the 45 who were well, in only 4 of them were spirochætes obtained in urethral or

meatal smears and in only 1 of the urines. Of the 48 who were ill spirochætes, which were neither meatal nor "icterohæmorrhagica," were found in 3.

On the other hand, Patterson, on examining urines (collected with precautions) of a small series of febrile cases (P.U.O.),* found spirochætes often abundantly during and immediately after the rise of the temperature and scantily during the afebrile intervals. Though one of his illustrations depicts the urethral type of spirochæte, his observation receives some support from Nankivell and Sundell, who found spirochætes, not of the urethral type, in the urines of 12 out of 15 trench fever cases examined.

Weighing up these observations we may conclude: (1) that there exist contaminating urethral spirochætes of the meatal type and the *refringens* type, with characteristic features which may be eliminated as a source of error by washing the glans and meatus and catching the middle portion of urine in a sterile flask; (2) that in healthy and most ill people spirochætes are not excreted by the kidney; (3) that in spirochætosis icterohæmorrhagica the causal spirochætes are always excreted by the kidney; (4) that, as shown by Patterson and Flessinger in some cases of fever of unknown origin (P.U.O.) (but excluding enteric) spirochætes other than those of spirochætosis icterohæmorrhagica are excreted.

This last statement receives confirmation from an investigation of an outbreak of P.U.O. at Lorient by Pettit and Cristan. Their findings were as follows: 1. Spirochætes were present in the urine of these patients. They were numerous and found in greatest numbers when the temperature was high, and they were observed, unlike those of spirochætal jaundice, from the commencement of the illness. 2. This spirochæte, called *S. Lorient*, is longer and thicker, and its curves more irregular and deeper than *S. icterohæmorrhagiæ*, but the differences are not very marked. 3. Guinea-

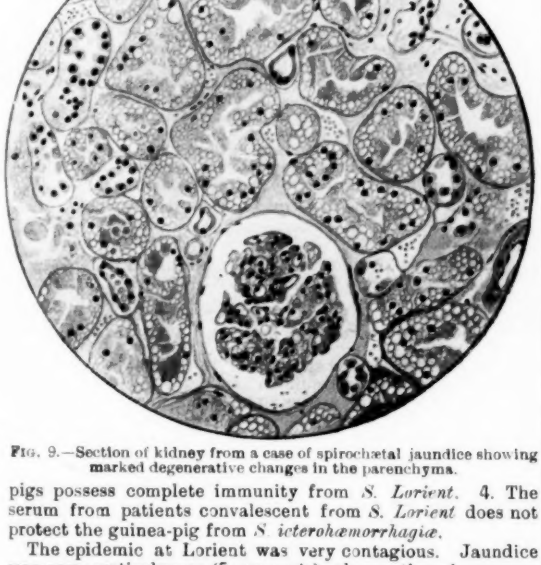


FIG. 9.—Section of kidney from a case of spirochætal jaundice showing marked degenerative changes in the parenchyma.

pigs possess complete immunity from *S. Lorient*. 4. The serum from patients convalescent from *S. Lorient* does not protect the guinea-pig from *S. icterohæmorrhagiæ*.

The epidemic at Lorient was very contagious. Jaundice was comparatively rare (5 per cent.); rheumatic pains were a common feature; sometimes the spirochæte was not found in the urine.

There is, then, another pathogenic spirochæte whose appearances are somewhat close to those of *S. icterohæmorrhagiæ*, and this fact has to be borne in mind. But in the diagnosis of spirochætosis icterohæmorrhagica the presence of the typical spirochæte taken in conjunction with the clinical manifestations is strong evidence on which a positive conclusion is warranted.

Before concluding I should like to take this opportunity of heartily thanking my colleague Captain S. P. Bedson, R.A.M.C., for his valuable help in the work of this address.

* Pyrexia of uncertain origin.

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# The Harveian Oration
ON
# THE DOCTRINE OF CONSUMPTION IN HARVEY'S TIME AND TO-DAY.

*Delivered before the Royal College of Physicians of London on Oct. 18th, 1918,*

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(*Concluded from p. 546.*)

## OBSERVATIONS OF OTHER AUTHORS.

Thomas Willis (1621-1678) deals very briefly with the subject, but he makes the important observation that the general belief that phthisis is a pining away of the whole body arising from an ulcer in the lung is untrue. In proof of this statement he says that he had opened the dead bodies of men who had died of this disease, in whom the lungs were free from any ulcer, and yet they were set about with tubercles or stones or sandy matter throughout.

"Wherefore phthisis is better defined as a withering away of the whole body arising from an ill formation of the lungs."

Waldenburg thinks that Willis may have intended to describe miliary tubercles by the term "sandy material."

Sydenham (1624-1689) added nothing fresh to our knowledge of consumption, but he recommended daily riding on horseback as the principal assistant in the cure of this disease.

Bonetus, a contemporary of Sylvius and Willis, in his "Sepulchretum," gives records of 150 necropsies of consumption from his own experience and from that of others. He regards phthisis as due to many different causes: ulcer of the lung, abscesses, scirrhous tumours, tubercles, vomicæ. He speaks of tubercles as tubercula glandulosa, following Sylvius. Vomicæ are closed collections of pus which resemble ordinary abscesses, but may be formed from tubercles. He seems to have described miliary tubercles in the following passage:—

"Pulmonum parenchyma ..... duriusculum erat et multis quasi granulis instar steatomatum quae aliquid sebacei continebant, refertum."

Mangetus, who edited the "Sepulchretum" of Bonetus in 1700, added some further cases of phthisis, among which are included instances of generalised miliary tuberculosis. One case is summed up thus: "Grandines pulmonum aliorumque partium cum phthisi."

Morgagni (1682-1771) was so convinced of the contagious nature of consumption that he carefully avoided the dissection of those dead of this complaint. The cases which he describes in his great work, "De Sedibus et Causis Morborum," seem to have been drawn from the records of his teacher, Valsalva, who held similar views about contagion. Valsalva made the important observation that in all the cases he had dissected the ulcers and disease were in the upper part of the lungs. Morgagni considered that phthisis may be the result of the suppuration of tubercles, but he recognised other causes, and he accepted Morton's opinion concerning the connexion between scrofula and consumption.

### *Pierre Desault.*

Pierre Desault, a physician of Bordeaux, who lived in the latter part of the seventeenth and the early part of the eighteenth century, published his views on phthisis in 1733, four years before his death.

In this work, which has great merit, he expresses himself very clearly. The causes of phthisis are divided into conjoint and antecedents. The conjoint cause is that whose presence sets up the disease and whose destruction leads to a cure. This cause he refers to tubercles and concretions found in the substance of the lung and scattered through the different lobes. These concretions resemble hailstones and are of different sizes. From this description it is probable that Desault was acquainted with miliary tubercles. He goes on to say that—

"If we read Morton's book on phthisis we shall find no account of an autopsy without the discovery of tubercles, to which he ascribes all the symptoms of the disease in such a fashion that I need do little more than translate and copy his words."

All previous writers, both ancient and modern, with the exception of Willis, were agreed that the cause of phthisis is an ulcer of the lung. Desault rejects this view, relying on the results of his own experience. Post-mortem examination of certain cases of phthisis which presented characteristic symptoms during life revealed a complete absence of ulceration, though the lungs were stuffed with tubercles. Phthisis is due to tubercles; ulceration of the lung is a secondary process. The symptoms of the disease precede the occurrence of ulceration, and are therefore not due to ulceration but to tubercles.

He compares phthisis with scrofula (*écrouelles*), both of them chronic diseases. Phthisis begins with tubercles or tumours in the lung, scrofula with tumours in the neck. In both cases the tubercles or tumours become inflamed and suppurate. Suppuration of scrofulous tumours leads to the formation of ulcers which are slow to heal, and can only be cured by destroying the tumours and the cause which produces them. The same is true of ulcers in the lungs resulting from the suppuration of tubercles. Both diseases in the stage of suppuration are contagious.

Desault believed that the contagion in this case, as in venereal disease, depends on the presence of worms. If we substitute micro-organisms for worms, there would be little to add even now to this statement, and, in any case, we may fairly credit Desault with a true prophetic instinct. The doctrine of "phthisis ab hæmoptoe" advocated by Morton and nearly all previous authors is rejected by Desault, who says that this chapter in Morton's book should be headed "Hæmoptoe a Phthisi," for hæmorrhage is the result, not the cause, of phthisis.

Young people between the age of 18 and 35 are most liable to be attacked by phthisis, as Hippocrates pointed out, but other ages are by no means exempt, for one meets with the disease in persons at ages below and above these limits, though less frequently. The subjects of phthisis for the most part are: 1. Those with contracted alar chests. 2. Those with a phthisical parentage and hereditary disposition. 3. Those exposed to contagion, in which Desault is a firm believer.

"Those who live with phthisical patients and wait on them may take the disease, though there be no hereditary disposition, for it is contagious. Thus wives who wait upon their phthisical husbands often contract the disease, and husbands who wait on their phthisical wives."

Desault was an enthusiastic supporter of the treatment of phthisis by horse exercise recommended by Sydenham, and he gives instances of the good results obtained by this means.

### *Cullen and Stark.*

Cullen did not make much advance on the views of Sylvius and Morton.

Tubercle is the commonest of many causes of consumption. The lung may contain tubercles without any symptoms for a time, but finally the tubercles suppurate and lead to phthisis. Tubercles are small swellings resembling indurated glands. Phthisis is common in persons of scrofulous parentage. Cullen assumes the existence of a predisposition to the disease in certain individuals. Some cases that cough up calcareous matter, with or without blood, recover, others die. Asthma frequently terminates in consumption. Cullen did not favour the contagious origin of the disease.

William Stark, who died in 1770 at the early age of 29, deserves special mention for his excellent work on the morbid anatomy of phthisis.

Educated at Glasgow and Edinburgh, at which latter University he was a favourite pupil of Cullen, he came to London in 1765 and entered at St. George's Hospital. In 1767 he graduated at Leyden. His Clinical and Anatomical Observations were not published till 1788, 18 years after his death.

Tubercle is described as follows. In the cellular substance of the lungs are found roundish firm bodies named tubercles, of different sizes, from the smallest granule to about half an inch in diameter; the latter often in clusters. The tubercles of a small size are always solid, even those of a large size are frequently so; they are of a whitish colour, and of a consistence approaching nearly to the hardness of cartilage; when cut through the surface appears smooth, shining, and uniform. No vesicles, cells, or vessels are to be seen in them, even when examined with a microscope, after injecting the pulmonary artery and vein.

This description shows that he was familiar with miliary tubercles, though he does not use that term. He then traces the development of vomicæ from tubercles and their communication with the air passages. Near the larger cavities the pulmonary vessels are suddenly contracted and the bronchi are thickened. The upper and posterior parts of the lung are first and most affected. Stark gives what I believe is the first account of an aneurysm of the pulmonary artery, measuring 1 × ¼ inch, opening into a vomica in the lung with a slit on one side of it. The patient died of hæmoptysis. No explanation of the cause of the aneurysm is offered.

### *Matthew Baillie's Description of Tubercles.*

Matthew Baillie (1761-1823) at the end of the eighteenth century gave an admirable description of tubercles in the lungs, to which little has been subsequently added.

He believed that tubercles arise in the cellular tissue of the lungs and are not glandular in origin, as no glands exist in the lungs, "and on the inside of branches of the trachea, when there are follicles, tubercles have never been seen."

Tubercles "are at first very small, being not larger than the heads of very small pins, and in this case are frequently accumulated in small clusters. The smaller tubercles of a cluster probably grow together and form one larger tubercle. The most ordinary size of tubercles is about that of a garden pea, but they are subject in this respect to much variety. They adhere closely to the substance of the lungs, have no peculiar covering or capsule, and have little or no vascularity. When cut into they are found to consist of a white smooth substance possessing a firm texture, and they often contain in parts a thick curdy pus.

In cutting into the substance of the lungs a number of abscesses is sometimes found, from tubercles of a considerable size having advanced to a state of suppuration. In the interstices between these tubercles the lungs are frequently of a solid texture, from the cells being in a great measure obliterated. The texture of the lungs on many occasions, however, round the boundaries of an abscess is perfectly natural. ..... When tubercles are converted into abscesses phthisis pulmonalis is produced, one of the most destructive diseases in this island."

In other parts the lung may be converted into a white soft material, like that of a scrofulous gland just beginning to suppurate. This appearance he attributes to scrofulous matter deposited in the lungs.

"It seems to be the same matter with that of the tubercle, but only diffused uniformly over a considerable portion of the lungs, while the tubercle is circumscribed."

Baillie described tubercles in other organs, but he did not offer any explanation concerning their relation to similar disease of the lung.

*The Influence of Bayle's Views.*

The great work of Bayle in the early part of the last century marks the commencement of a new era in the conception of phthisis.

He divided the disease into several classes—tuberculous, granular, ulcerative, melanotic, calculous and cancerous; of these the tuberculous is the most common. This artificial classification, including tuberculous and non-tuberculous affections, did not long survive. Bayle's description of tubercles does not differ in essentials from that given by Baillie. The smallest tubercles he calls miliary. These are opaque or yellowish and tend to suppurate and break down to form an ulcer.

Bayle's criterion of tubercle was an opaque or cheesy substance. Tubercle may be encysted or non-encysted, nodular or diffused. What Baillie called scrofulous matter, Bayle called tuberculous. Like Baillie, he assumed a close connexion between scrofula and tubercle. In addition to tubercles, certain transparent hard miliary nodules were described in the lungs; these were called miliary granulations and were stated to differ from miliary tubercles in the fact that they never became opaque or cheesy. From their hardness and translucency, Bayle regarded them as of the nature of cartilage.

The simultaneous appearance of tubercles in various organs of the body convinced Bayle that the explanation was to be found in a common cause and he attributed this dissemination to a tendency to the production of tubercles, a tuberculous diathesis or disposition. This diathesis was the common cause of tuberculous phthisis, which is a general disease, and for this condition the term tuberculosis was first employed by Bayle.

LAENNEC'S DOCTRINE OF THE UNITY OF PHTHISIS (1781-1826).

The conception of a tuberculous diathesis had a profound influence on contemporary thought, and for 50 years after Bayle's death its effects could still be traced in medical literature. It needed the touch of genius to dispel the mists that obscured the relations of phthisis to tubercle, and this was supplied by Laennec's masterly treatment of the whole subject. Laennec proclaimed the doctrine of the unity of phthisis. All phthisis is tuberculous.

"Tuberculous matter may be developed in the lungs and other organs under two principal forms: that of isolated bodies and that of infiltrations. Whatever be the form under which the tuberculous matter is developed it presents at first the appearance of a grey and semi-transparent substance, which becomes by degrees yellow, opaque, and very dense. It then softens, gradually acquires a liquidity about equal to that of pus, and being expelled through the bronchi it leaves in its place cavities commonly known as ulcers of the lung, and which I shall designate by the name of tuberculous excavations."

He then describes miliary tubercles and Bayle's granulations and shows that transitional forms connect the two, proving that the latter are only an early stage of the former; in his own words—

"There is no other difference between them than that which exists between the green fruit and the ripe."

All cheesy matter is tuberculous, even that which is sometimes seen in cancerous growths. Inflammation plays no part in the production of tubercles which may develop in any organ of the body and are to be regarded as new formations.

Scrofulous glands are tuberculous. Hæmoptysis is never the cause of phthisis, but is always the result of disease already established. Tubercle, wherever situated, is connected with a certain disposition, but "the real cause, like that of all diseases, is probably out of our reach."

These views met with strong opposition on the part of some of Laennec's own countrymen.

Thus Broussais, accepting the tuberculous nature of phthisis, regarded tubercle as the result of irritation and inflammation of the lung, pleura, or bronchi, reverting to the standpoint of the seventeenth century, when the Hippocratic tradition still largely prevailed.

Andral took up a somewhat different position. While he embraced the idea of a tuberculous diathesis, he denied that tubercle is a new formation. According to his conception caseous or tuberculous material represented inspissated secretion in the small bronchi and lung which gradually becomes more compact and ultimately suppurates. The common causes of phthisis are pneumonia, pleurisy, catarrh, or hæmoptysis occurring in persons with a tuberculous diathesis. He supported Bayle's view that miliary granulations are distinct from miliary tubercles and considered that they represented discrete areas of alveolar inflammation.

Louis by his elaborate pathological and clinical observations gave strong support to Laennec's views.

Rokitansky put forward a theory of a tuberculous crasis, dyscrasia or blood change depending on a hyperinosis. Tubercle is an exudation which may be inflammatory and acquires a special fibrinous or tuberculous character in virtue of a tuberculous crasis. Scrofula and tuberculosis are identical.

In England Laennec's doctrine in the main was generally adopted.

HISTOLOGICAL OBSERVATIONS.

Until nearly the middle of last century pathological views were based almost entirely on naked-eye observations. But about this time the microscope began to be employed with important results and numerous observations were made on the histology of tubercle.

Lebert described certain small cells or tubercle corpuscles which were pathognomonic of tuberculous material.

Reinhardt disputed the specificity of these cells and showed that similar appearances may be presented by pus corpuscles.

William Addison regarded tubercle as consisting of epithelial cells derived from the white corpuscles of the blood.

VIRCHOW'S WORK.

Virchow in his great work "Die Krankhaften Geschwülste" essayed to revolutionise the whole doctrine of tuberculosis.

Miliary tubercle is the only criterion of what is tuberculous. Caseation, though a common change in tubercles, is not a specific process; it may occur in new growths, and is often the result of inspissated pus. This transformation is a necrobiosis and is allied to other forms of degeneration. In pulmonary phthisis inflammation is the chief factor and may terminate in caseation. Tubercle plays a subordinate part. The cells of tubercle resemble the cells of a lymphatic gland. Tubercle is a heteroplastic lymphoma; its seat is the connective tissues of the body.

Scrofula is not a specific disease, but a manifestation of a general vulnerability of tissue and proclivity to disease. Heredity is recognised as a potent factor. What is inherited is a certain disposition or vulnerability, not the disease itself.

Niemayer applied Virchow's views in their most extreme form to the clinical history of phthisis, which he divided into two groups—miliary tuberculosis and chronic caseous pneumonia.

Any form of pneumonia may terminate in phthisis, but in most cases it is a chronic catarrhal pneumonia which leads to caseation and excavation. Hæmoptysis may set up a caseating pneumonia and is a common cause of phthisis. Miliary tuberculosis is seldom a primary affection of the lung, but is generally secondary to ulcerative pneumonia or to a caseous lymphatic gland. Phthisis is not a specific disease and is not hereditary. A congenital vulnerability and a tendency to a luxuriant growth of cells are the distinguishing marks of this disease, and in this sense there is a connexion between phthisis and scrofula.

This profession of faith, supported by the great authority of Virchow, found much favour in Germany. But in France and England the great majority of physicians held firmly to Laennec's doctrine of the unity of phthisis.

DEMONSTRATION OF INFECTIOUS NATURE OF TUBERCULOSIS.

In 1857, when discussions about tubercle were still chiefly concerned with histological details, Buhl came forward with

the important statement that generalised miliary tuberculosis is the expression of an infection of the blood originating in a caseous focus situated in a lymphatic gland, in the lung or in some other part of the body. This was the first attempt to explain tuberculosis on the basis of infection and constitutes a landmark in the inquiry.

Seven years later Villemin made known the results of his memorable researches on the experimental production of tuberculosis in animals.

Rabbits and guinea-pigs inoculated with miliary tubercle, caseous matter or phthisical sputum, invariably developed tuberculous lesions in the serous membranes, lungs, and other organs. In certain animals, such as dogs, cats, and sheep inoculation was unsuccessful. Control inoculations with other material, such as cancer or anthrax, invariably failed to produce tuberculosis.

Villemin concluded from his experiments that tuberculosis is a specific inoculable disease, and he compared it with virulent maladies like small-pox, syphilis, and glanders. These conclusions were disputed at first on the ground that tuberculous lesions could be produced experimentally by the injection of non-tuberculous material. But after much controversy the truth of Villemin's views was universally acknowledged.

*Discovery of the Tubercle Bacillus.*

In 1867 William Budd, basing his opinion on geographical and epidemiological considerations, enunciated the view that phthisis is a zymotic disease like typhoid fever and that its propagation is determined by infection. But all doubts as to the infective nature of tuberculosis were removed by Koch's famous announcement in 1882 of his discovery of the tubercle bacillus.

The facts concerning Koch's brilliant research and the overwhelming proofs adduced by him in support of his conclusions are too well known to need recapitulation here. But we may pause a moment to pay homage to the genius of Laennec who conceived the doctrine of the unity of phthisis, to Villemin who supplied the first experimental evidence of the truth of this view, and to Koch who isolated the infective micro-organism, cultivated it outside the human body, and demonstrated its pathogenic action on the lower animals.

THE DOCTRINE OF CONSUMPTION AT THE PRESENT TIME.

Koch's discovery having furnished the most complete confirmation of Laennec's doctrine, non-tuberculous caseous pneumonia, which had long figured prominently in German writings, was now given a decent burial. Many elaborate and artificial classifications of phthisis shared the same fate. The old terms consumption and phthisis began to pass out of use, and tuberculosis, a term which we owe to Bayle, was generally adopted.

*Heredity and Predisposition.*

Some of Koch's most enthusiastic supporters were at first prepared to explain everything in the natural history of the disease by infection with the tubercle bacillus, and to throw all ideas of heredity and disposition to the winds. The temperate and judicial statements of Koch himself are in striking contrast with the attitude of these extremists, as Bulloch has pointed out.

In his monograph, "The Etiology of Tuberculosis," published in 1884, Koch admits that—

"Although a good many of the phenomena classed together under the head of 'predisposition' may be referred to simple and easily explained conditions, some facts still remain difficult or impossible to interpret, compelling us for the present to accept the view of a varying liability."

He further agrees that tuberculosis is hereditary in the sense that a predisposition is inherited. Careful statistical investigations by Pearson supply strong confirmation of the existence of a hereditary disposition. This question has been very ably discussed by Bulloch and Greenwood, who concluded that—

"the many workers who have dealt with the problem of inheritance and infection during the last few years have failed to achieve any real solid advance from the classical position."

*Human and Bovine Tuberculosis.*

In Koch's opinion the main, if not the only, source of pulmonary tuberculosis is the dried sputum of tuberculous patients which reaches the lungs through the air passages. Villemin had expressed similar views. The aerogenic origin of the disease has been disputed, but the rival view which regards pulmonary tuberculosis as enterogenic has received less support than the former.

The relation of human to bovine tuberculosis had engaged the attention of Villemin, who concluded that the two diseases were different. But Klebs and later workers, including at first Koch himself, regarded them as identical. This was the prevailing view, though doubts were expressed by individual writers, until 1900, when Koch made the startling announcement that further experiments had convinced him that human and bovine tuberculosis are distinct diseases, and that pulmonary tuberculosis is invariably due to infection by bacilli of human origin.

In spite of numerous researches on the alleged morphological and cultural differences exhibited by tubercle bacilli of the human and bovine type, no general agreement has been reached. But that there is a difference in the pathogenic effects on animals there seems to be no doubt. Inoculation of bovine bacilli is followed by an acute general tuberculosis, whereas when human bacilli are employed the effects are limited to a local tuberculosis at the site of inoculation or to a comparatively mild and chronic form of infection. In 1903 Behring proclaimed the opinion that infection of infants by the milk of tuberculous cows is the chief source of pulmonary tuberculosis.

Further investigation, however, has confirmed the truth of Koch's view that pulmonary tuberculosis is invariably due to infection with tubercle bacilli of the human type. This question has been fully discussed by Bulloch in his Horace Dobell Lecture, delivered before the College in 1911, to which I am much indebted.

*The Seed and the Soil.*

Records of autopsies at hospitals show that in a large percentage of all dead bodies 70–90 per cent. arrested tuberculous lesions are found in the lungs or other organs. It is clear, therefore, that the number of persons that recover from the infection greatly exceeds the number of those that succumb. Man is evidently more resistant to tuberculosis than the ordinary laboratory animals, though less so than animals like the cat, dog, sheep, horse, and ass. Koch has pointed out that in the human subject a temporary immunity is often manifested, periods of partial or apparently complete recovery alternating with phases of active infection.

There seem, then, to be intermediate grades of immunity in man contrasting with the complete immunity of certain animals. By analogy we may infer that these different grades of immunity in man and the lower animals depend on defensive arrangements which are similar in kind and vary only in degree. We can hardly doubt that the explanation of these differences is to be found in biochemical variations at present imperfectly understood.

Hereditary disposition may be explained on similar lines. These considerations illustrate the importance of the part played by the soil in which the germ of tuberculosis is planted. This fact had not escaped the acute observation of Villemin, who insisted on the interdependence of two factors in tuberculosis, the virus and the "milieu organique."

A further study of the soil, or "milieu organique," is the most pressing need for the better understanding of the pathology of tuberculous infection. This inquiry is intimately connected with the explanation of immunity—a subject bristling with difficulties. In recent controversies as to the relative importance of phagocytosis and chemical action of the body fluids we seem to witness a renewal of the old contest between the cellular and humoral pathologists. But, in spite of the immense amount of research devoted to the study of immunity, no general conclusion has yet been reached. This need not surprise us in view of the complexity of the problems involved.

*The Mortality of Tuberculosis at Various Age Periods.*

When the infectious nature of the disease had been finally established by Koch great results were anticipated from the application of this knowledge to the prevention of tuberculosis. But, so far, the results have been disappointing.

The death-rate from phthisis had been steadily falling for a number of years before the discovery of the tubercle bacillus, and no accelerated reduction has taken place in recent years. Furthermore, since the Great War began in 1914 there has been a steady rise in the phthisis death-rate, the causes of which have yet to be worked out. A recent paper by Brownlee on the epidemiology of phthisis pulmonalis, based on statistical tables of the death-rates at different ages

in different districts, raises points of great interest. His conclusion is that there are at least two types of phthisis, one especially affecting young adults and one middle age.

The type affecting middle age seems to have been the chief type in London for more than 200 years. Sydenham's statement that the usual age at which death from phthisis occurs is between 15 and 30 is taken directly from Hippocrates. When Morton, who gives the actual ages of phthisis deaths, is consulted, it is found that a very large proportion of cases are over the age of 30. Further investigation has shown that the young adult type, which is the prevailing one in Ireland and Shetland, spreads independently of environment, being as common in the more healthy parts of a district as in the unhealthy, while the amount of middle-age phthisis is correlated to the unhealthiness of a district.

The explanation suggested is that phthisis is not one disease, but a mixture of at least two allied diseases, an explanation to which the recent discoveries regarding typhoid fever furnish an analogy. In one form of phthisis the chief death-rate occurs between the ages of 20 and 30 years; in a second form the maximum death-rate occurs between the ages of 45 and 50 years. This hypothesis does not, in the present form, explain the occurrence of phthisis at high ages observed in Wales and Cornwall. It is possible that the senile form is due to the same organisms as that which causes the young adult type. It is well known clinically that many persons develop phthisical lesions in their youth, which apparently heal, while later in life a recurrence of the disease or a new infection leads quickly to a fatal issue. No district by itself gave any clue to the meaning of the phenomenon of phthisis at the later age observed in Wales and Cornwall. Light on this type was obtained from the statistics showing the susceptibility to phthisis in different occupations. It was found from these data that a very marked susceptibility to phthisis at later ages was shown by coal-miners, though the total amount of phthisis occurring among them was very small.

A study of the phthisis death-rate in England generally during the last 60 years shows a great reduction at all ages. This is most marked at the age period 20 to 25 years. At the middle and later ages the fall has not been nearly so marked. The result has been to raise the mean age at which death from phthisis occurs. No completely satisfactory explanation of this fact is possible at present.

The figures available suggest that an epidemic of "young adult" phthisis culminated about the middle of last century, since which date that form of the disease has markedly diminished. It is to be hoped that further investigations on these lines will enable Brownlee to clear up some of the questions raised in his valuable paper.

### CONCLUSIONS.

If we look back and review the progress of knowledge we see how Laennec's great generalisation was foreshadowed by the work of Richard Morton. For Morton was the first to point out that consumption is in all cases associated with the presence of tubercles in the lungs. Thomas Willis had previously broken away from the Hippocratic tradition that phthisis and ulceration of the lung are convertible terms.

Sylvius, their great contemporary, whose influence must have powerfully affected both Willis and Morton, had not taken up such a definite position himself, though, as already shown, he had made important contributions to the pathology of consumption. His views on the fluctuating activity of the humours or secretions of the body and their relation to consumption find their counterpart at the present time in the temporary immunity which Koch discerns in the course of many cases of tuberculosis. The mutual relations of the different humours or secretions advocated by Sylvius and the modern development of the doctrine of the endocrine glands provide another illustration of the well-known fact that no great discovery is made without some previous preparatory work. Again, though the conception of tuberculosis as an infection first took definite shape in consequence of the experimental work of Villemin, we know that a belief in the contagiousness of consumption can be traced back as far as the time of Galen and Aristotle. Let us not forget the debt we owe to the Ancients. "Vixere fortes ante Agamemnona multi."

How true was Elijah's outburst—"I am not better than my fathers."

# ON A PYÆMIA DUE TO ORGANISMS OF THE *BACILLUS COLI* GROUP

## OCCURRING IN TURKISH SOLDIERS.

BY J. I. ENRIGHT, M.B., B.CH. N.U.I.,
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CASES of a peculiar pyæmia, with special involvement of the kidneys, apparently caused by *Bacillus coli* or one of its congeners, have been observed during the last year in Cairo. It was some time before the puzzling pyrexia with its attendant symptoms was recognised as a specific one. Nine cases in all were diagnosed in life, six others were recognised pathologically post mortem, but it is not improbable that the disease is much more frequent amongst debilitated orientals than these figures would indicate. In all but three of the cases which came to autopsy a dysenteric ulceration of the large intestine, and especially of the rectum, was present in all degrees of superficial necrosis and deep ulceration. Out of the six cases under treatment and still alive, three gave no history of a chronic diarrhœa or dysentery; the remainder had had many such attacks. It may be surmised that the organisms originally gained entrance to the blood stream through a breach of the mucosal surface in the lower part of the large intestine.

### *Symptoms, Clinical Signs, and Treatment,* by Captain J. I. ENRIGHT.

*Symptoms.*—The onset of such a pyæmic attack is usually ushered in by severe frontal headache, anorexia, vomiting, and an acute pain localised to one or both kidney regions. This pain radiates along the inguinal canal and terminates in the penis, or may be localised to the scrotum. Blood is often passed in the urine in the initial stages. There is generally some difficulty in micturition, though there may be at the same time no frequency or alteration in amount of urine. There may be no symptoms of vesical trouble whatsoever. Usually the patient looks extremely ill and is mentally dull; he sweats profusely. The temperature is invariably high (103°–104° F.), the pulse weak and rapid (110 or higher). At the outset there is invariably a severe rigor which lasts about 10 minutes. The temperature remains elevated for five days and then takes on an undulating and a remittent character.

On physical examination the lungs, heart, and liver were found normal; an occasional mitral systolic bruit of hæmic origin has been noted. The spleen is palpable. The abdomen is usually flaccid; some patients complain of constant pain in the epigastrium. No definite information can be obtained from microscopical examination of the diarrhœic stool, which may contain some disintegrated pus cells, suggestive of a chronic intestinal ulceration.

After an initial pyrexia of some 5 to 7 days the temperature gradually falls and the pulse resumes its normal rate. All the urgent symptoms disappear; after a few days of convalescence the patient is able to resume his duties. After a further 7 to 14 days the temperature suddenly shoots up and is followed by a rigor and vomiting; the former succession of symptoms is repeated seriatim. These relapses, averaging 5 days, alternating with apyrexial periods of 8 to 14 days, recur with a remarkable regularity. The patient grows weaker and progressively more emaciated. Finally he dies of toxæmia, it may be with ascites and a profuse diarrhœa with fæcal incontinence. At this stage the liver and spleen are definitely enlarged.

In cases which progress favourably under treatment the pyrexial cycles continue but diminish in intensity, and the apyrexial periods become gradually more prolonged, as long as five weeks. Such patients rapidly put on flesh, and after a convalescence of three months, during which there is no elevation of temperature, were discharged from hospital.

*Clinical signs.*—Only rarely was the *urine* found chemically normal. Usually it has a specific gravity of 1010–1020, contains no albumin or sugar, but a deposit of pus cells and clumps of motile bacilli. Very rarely a cloud of albumin has been found at the commencement of the attack due to the effusion of blood, and a few red cells were then found in the urinary deposit.

In all the cases except one in which a *cystoscopic examination* was made, owing to the kind assistance of Lieutenant-Colonel Wade, R.A.M.C., the viscus presented a perfectly normal appearance. As a rule, the ureteric orifice gave no clue to the pathological condition of the kidneys. Specimens of urine obtained by ureteric catheterisation and cultured on MacConkey's medium gave growths of the causative organism. A unilateral affection of the kidney can occur.

*Blood examination.*—An anæmia of the secondary type was present in all cases—reduction of red cells on an average to 2,500,000. A corresponding leucopenia with a proportional rise in the total lymphocytes was the only constant and characteristic feature. The serum of three patients from whose blood the bacillus was isolated during life did not contain any agglutinins to the organism itself, even when tested in its undiluted state with living cultures. This serum was also tested against typhoid, paratyphoid A and B, Shiga, and Flexner-Y bacillus, with an invariably negative result. In two cases the organism was obtained in pure culture from the blood during life, but only during the rigors. On six separate occasions blood cultures made during the quiescent period remained sterile.

X ray examination of the lumbar regions in one case revealed no information.

*Diagnosis.*—Amongst diseases most closely resembling it may be mentioned malaria, undulant and relapsing fevers. In its early stages dysentery, generalised tuberculosis, phlebotomus fever, or one of the enteric group may be suspected.

The results of blood culture can be supplemented by microscopical examination and cultivation of the urine. In one patient ultimately discharged feeling quite fit an organism having exactly similar sugar reactions was recovered both from the blood and from specimens of urine from both the bladder and ureters.

*Treatment.*—In the first few cases of *B. coli* pyæmia observed the treatment was based on symptomatic lines, together with the administration of autogenous vaccines of the bacillus as isolated from the blood (over a long period, in doses of from 5 to 120 millions), but no improvement was noted. It was decided to try intravenous eusol. The first injection was given to a patient who had been eight months in hospital on symptomatic treatment. He was then very weak and emaciated. The patient was about seven months under treatment and received nine intravenous injections of varying doses of eusol. During that period there were only three bouts of pyrexia (the last one very mild). He had increased considerably in weight, looked strong and healthy, and felt absolutely fit. Subsequently five other cases, treated on similar lines, have furnished almost equally brilliant results. (Eusol has also been successfully tried in a case of *B. coli* peritonitis following a gangrenous appendix, locally in the peritoneal cavity.)

*Pathology and Bacteriology, by* Captain P. H. BAHR.

*Morbid anatomy.*—This infection occurred coincidently and concomitantly with other diseases, such as tuberculosis, bacillary dysentery, and pellagra. In such it may reasonably be regarded as a terminal infection. Of the complicating diseases the most constant was chronic bacillary dysentery.

Two cases may be taken as examples of the effect produced by the toxins of the colon bacillus, uncomplicated by any other infection, upon the abdominal and thoracic organs. In both the parenchymatous degeneration of the heart, liver, spleen, and kidneys apparently produced by the toxins of the bacillus was very evident indeed.

*Heart.*—The whole organ was enlarged and the muscle pale and flabby.

*Liver.*—The liver was in both cases greatly enlarged (76 oz.; 100 oz.). Glandular tissue greatly degenerated. In one case there were numerous abscesses of varying size; glandular tissue was of ochreous colour; indications of commencing periportal cirrhosis. In case with biliary cirrhosis the abdomen was distended and contained 8 pints of purulent ascitic fluid, in which the bacillus was present in large numbers.

*Spleen.*—The spleen was very much enlarged (32 oz.; 22 oz.), with tense capsule and rounded margins. The substance was dark, soft, and diffluent. No melanin pigment found. All the characteristics of a "septic spleen." *B. coli* organisms in smears and cultures made from it in three cases.

*Kidneys.*—The kidneys were enlarged in both cases (in one, R. 12 oz., L. 13 oz.). Capsule stretched and adherent to many subcortical abscesses. Whole organ of pale ochre colour; cortex swollen and bulged on section; medullary striæ evident as bright yellow lines. The cortical zone itself was studded with abscesses.

The kidneys in different cases showed all intermediate stages between large swollen and small contracted granular kidney. In the latter both kidneys weighed about 4 oz. each; substance tough and fibrous; cortical zone contracted and scarred with depressed, pigmented, wedge-shaped cicatrices, in which were embedded small abscesses with thick caseous pus. (Plate I.) Evidently it would seem that the kidney may become completely fibrosed and contracted, and may then even resemble the small granular kidney of chronic interstitial nephritis, both macro- and microscopically. That both kidneys need not necessarily be implicated is shown by a study of one case. Here the right kidney was perfectly normal in structure both macro- and microscopically, while its fellow contained several cortical and subcortical abscesses.

*Lymphatic glands.*—In the two cases which died in the acute stage the abdominal lymphatic glands were much enlarged, soft, and of a greenish colour. Retroperitoneal group and those at portal fissure implicated; in one instance pure culture of colon bacillus was obtained.

*Intestines.*—The intestinal ulceration present in majority of cases was mostly confined to lower part of intestinal tract. It was of a deep undermined, sinuous type, extending to muscular coat; the ulcers corresponded to transverse folds of mucous membrane. No amœbæ were found; Flexner-Y bacilli were isolated from similar ulcers in Turkish prisoners.

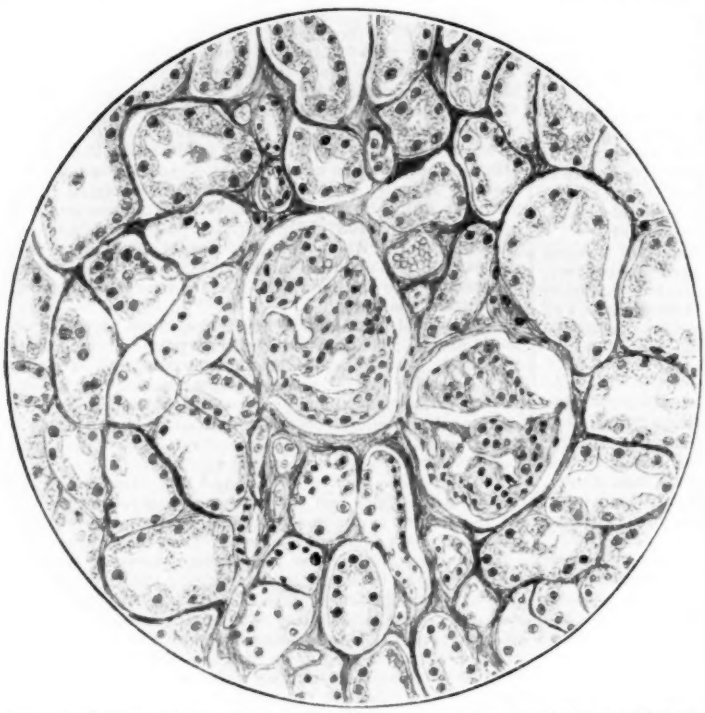

PLATE I.—Section of kidney cortex (Case 3) showing appearance resembling that of chronic interstitial nephritis. Objective, Zeiss 1·6; ocular Baker 2 × 7 = × 300 diameters. Stained by hæmatoxylin and eosin.

*Microscopic pathology.*—This was mainly confined to the three organs most affected—kidneys, liver, and spleen. Sections were stained by various methods; for tissue changes hæmatoxylin and eosin or hæmatoxylin and Van Gieson were employed; but by far the best pictures of the organisms in the tissues and the effects they produced upon them were obtained in sections stained by carbol-thionin blue, as well as by Gandoucheau's stain (Borel's blue and eosin).

*Kidneys.*—Plate II. is drawn from a series of sections from different cases. In A the bacilli can be identified in the stellate arteries and in the glomeruli, whence they pass into the intertubular capillaries. There it would appear that their passage becomes blocked and, multiplying, they form large masses. They may also be found in large clumps

in the larger veins of the medulla (B). In this latter situation the organisms make their way (C) through the columnar epithelium of the ducts of Bellini into the lumen; from them they pass into the urine, together with a number of pus cells and a quantity of cellular débris. It is striking to observe the small amount of cellular infiltration in the vicinity of the organisms, and the small amount of destruction of the neighbouring convoluted tubules. The process of pus formation and cicatrisation appears to be a very gradual one. The lumen of the loops of Henle is filled with a coagulated serous exudate staining green with carbol-thionin; there is dilatation of the intertubular capillaries and a shrinkage of the glomeruli within their capsules. Eventually (Plate I.) a considerable destruction of the glomeruli, together with a dislocation and consequent desquamation of the tubular epithelium of the convoluted tubules, takes place.

In the medulla (Plate II., B) the destruction of the collecting tubules has proceeded to a considerable degree.

The cellular infiltration occurring around the collecting tubules in the medulla is composed mainly of mononuclear cells, together with smaller number of plasma cells. (C, Plate II.) In the kidneys most severely affected, few traces of the original glandular structure can be made out, and very few organisms can be seen in sections. On the other hand, the blood-vessels are packed with polymorphonuclear pus cells migrating to the cortex, and the abscesses consist of a dense collection of pus cells around greatly shrunken and destroyed glomeruli.

When cicatrisation has taken place to any large extent the changes in the glomeruli and tubules immediately bordering on the site of the abscesses resemble in their histology those seen in chronic interstitial nephritis, and may be regarded as an indication of the effects of chronic absorption of *B. coli* toxins upon normal kidney tissue. (Plate I.)

*Liver.*—In all sections examined there were abundant signs of a periportal infiltration resembling that seen in early alcoholic cirrhosis. There is a considerable increase in the periportal fibrous tissue, together with an outpouring of round cells. The liver cells themselves have undergone fatty degeneration.

In one case the section passes through a small hepatic abscess. The main type of cell in the exudate is, apparently, the small mononuclear, very few polymorphs being visible. The abscesses in the liver appear to have no definite limitation, and there has been no attempt at fibrous tissue formation; in addition the hepatic cells in the immediate vicinity are considerably damaged.

*Spleen.*—Collections of organisms can be made out lying free in the venous sinuses of the spleen pulp, or sometimes in the centre of a Malpighian corpuscle and surrounded by collections of small mononuclear cells. The hypertrophy of fibrous tissue is marked both in the capsule and in the trabeculæ. This fibrosis of the spleen appeared to be common to all the cases of the series.

*Bacteriology.*—The morphology of the bacilli in these cases was studied in smears and sections made from the organs and in cultures stained by Romanowsky or thionin methods.

In the tissues they appeared as fusiform bacilli, with marked bipolarity, together with the appearance of diplo-bacillary forms; these were also seen in young agar cultures, indicating, apparently, a rapid proliferation on the part of the organism. In smears of the spleen stained by Giemsa this bipolarity was so pronounced as to give the impression that one was dealing with an infection of *B. pestis*. All cultures were Gram-negative.

All the strains isolated were either non-motile or perhaps feebly so.

*Sugar reactions, &c.*—In the reactions on the sugars a very considerable difference was noted, and found constant for the same strain of bacillus. From the clinical resemblance of these cases, from which apparently distinct organisms were obtained, we cannot bring ourselves to regard the variations of these sugars, not even of such an important sugar as lactose, as marking such a great diversity in the nature of the organisms involved, for it is very evident from post-mortem studies, as well as from microscopical sections, that their pathogenic action on the tissues was in all cases almost identically the same.

According to their reactions with five sugars in peptone water the organisms isolated can be divided arbitrarily into nine groups (A to I), of which three—A, E, and F—do not ferment lactose, and I cannot find any record of these having been previously classified. In the table are shown the characters of these organisms after 24 hours' incubation in 1 per cent. sugars and 1 per cent. peptone water.

The commonest type recorded is D, which corresponds with the *Bacillus neapolitanus* of Emmerich, and occurred 8 times out of 21 organisms isolated. It was isolated in pure culture from the blood, right kidney, spleen, urine, and rectum of Case 8. Cultures from the left kidney, liver, mucous cyst from rectal wall of same case gave slightly different reactions (G, I). There is reason for presupposing that they are merely variants of the same bacillus.

Type H would seem to correspond to *B. oxytocus perniciosus* (MacConkey); it was isolated twice from spleen and liver of same post-mortem.

Type I, isolated twice, corresponds in its reactions to those given for *B. acidi lactici* (Hüppe).

The remaining types B, C, and G, without reference to more extensive literature, cannot be placed in any classification.

*Pathogenicity.*—A limited number of experiments were made with broth cultures and agar emulsions of these organisms on rabbits. From ½ to 1 c.cm. of 24-hours old broth culture was injected intravenously, but only produced a transient indisposition. Opalescent emulsions of agar slopes after 24 hours' incubation were then tried in doses of 1 c.cm. Two types of the organism (B and C) proved pathogenic. Type A would appear to have but slight pathogenic properties for rabbits.

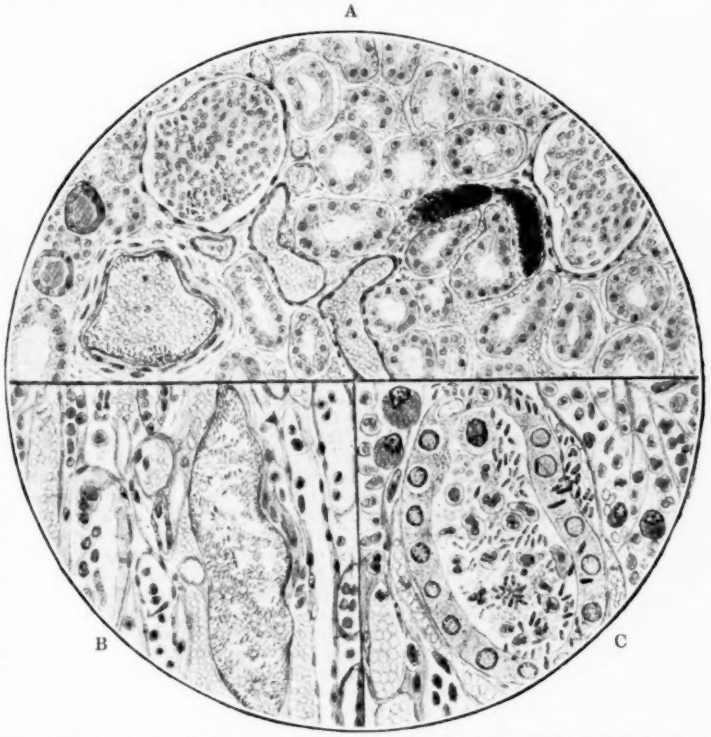


PLATE II.—A. Section of renal cortex showing emboli of organisms in stellate arteries, glomeruli, and intertubular capillaries. Note the apparently normal appearance of the adjacent convoluted tubules. Objective, Zeiss 1·6; ocular, Baker 2 × 7 = × 200 diameters. (Case 3.)
B. Section of renal medulla showing a large collection of organisms in a medullary vein, with destruction of the tubular epithelium and dilatation of adjacent capillaries. Zeiss 1·6; ocular, Baker 8. × 300 diameters. (Case 7.)
C. Section through a duct of Bellini showing the passage of bacilli through the tubular epithelium and numbers in the lumen with polymorph cells and débris. Zeiss 1/12; ocular, Baker 8. × 1000 diameters. (Case 6.) Stained by carbol-thionin.

| Type. | Glucose. | Lactose. | Saccharose. | Mannite. | Dulcite. | Indol. | Neutral red. | Milk. |
|---|---|---|---|---|---|---|---|---|
| A | A.G. | – | A.G. | A.G. | – | + | – | Acid.* |
| B | A.G. | A.G. | A.G. | – | – | – | + | Acid and clot. |
| C | A.G. | A.G. | (A.) | A.G. | – | + | + | Acid. |
| D | A.G. | A.G. | – | A.G. | – | + | + | Acid and clot. Acid. |
| E | A.G. | – | – | A.G. | – | + | – | Acid. |
| F | A.G. | – | A.G. | – | – | – | – | ,, |
| G | A.G. | A.G. | – | A.G. | A.G. | + | + | Acid and clot. |
| H | A.G. | A.G. | A.G. | A.G. | A.G. | + | + | Acid and clot. Acid. |
| I | A.G. | A.G. | A.G. | A.G. | – | + | + | Acid. |

* In one instance returning to alkaline in 48 hours.
(A.) = Slightly acid. A.G. = Acid and gas. + = Fluorescence in neutral red and positive indol.

We wish to thank Lieutenant-Colonel Vickerman, R.A.M.C., for permission to record these cases, and also for much help and encouragement. Our thanks are also due to Lieutenant-Colonel Wade, R.A.M.C., consulting surgeon to the Forces in Egypt, for kind and continued assistance.

# OBSERVATIONS ON A SMALL LOCALISED EPIDEMIC OF INFLUENZA,

## WITH SPECIAL REFERENCE TO THE INCUBATION PERIOD.

BY MICHAEL G. FOSTER, M.D., F.R.C.P. LOND.,
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AND
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IN this epidemic, owing to a combination of circumstances, observations were possible which furnish a few definite data in connexion with the incubation and spread of influenza.

These observations were made at a general hospital in France during the height of the influenza epidemic, where, owing to lack of beds in the medical wards, medical cases were placed in some of the surgical wards.

*The Cases in Beds 62, 63, and 61.*

On the evening of June 6th a man suffering from bronchitis was admitted into a surgical ward in which for some days past no patient had shown signs of a medical malady. This man had gone sick with a febrile attack on June 1st; cough, accompanied by copious expectoration, soon made its appearance. On admission he had a temperature of 99° F., with crepitations at both bases. The temperature fell to normal on June 10th and the signs rapidly cleared up. The duration of the fever, the presence of crepitations, and rapid recovery tend to indicate that this was a case of influenza. This man was notably dirty in his habits, constantly failing to use the sputum mug and spitting promiscuously on the floor.

The arrangement of the beds in the ward is indicated in the accompanying diagram. The patient referred to was in bed 62. In the adjoining bed, No. 63, was a patient with a wound of the knee-joint infected with *S. aureus:* the temperature in this case had been running a steady course of 99–100° for some days past; on the evening of June 9th his temperature rose to 103·6°. In view of the possibility that this rise of fever might indicate a general septicæmia the blood was taken for culture, and from this culture small Gram-negative rods were recovered which, from the aspect of their colonies on blood-agar, their staining reactions, and morphological characteristics, conformed to *B. influenzæ* Pfeiffer. A study of the chart in this case indicates a short attack of pyrexia lasting four days, and directly due to *B. influenzæ* engrafted upon a condition of chronic septic absorption.

The patient in the bed No. 61 was suffering from a gunshot wound of the arm, accompanied by irregular fever ranging from 98–102°. In this case, again, there was a sudden rise of temperature to 104° on the afternoon of June 9th, accompanied by conjunctivitis, cough, and some expectoration; the temperature remained 104° or slightly lower until the 11th, finally falling somewhat abruptly to subnormal on June 14th. Pfeiffer's bacillus was not recovered from the sputum in this case. The duration of the pyrexia, taken in conjunction with the presence of catarrhal symptoms in the one case, and bacteriological proof of invasion by Pfeiffer's bacilli in the other, warrant the assumption that both were cases of influenza. That the infecting agent was the patient who came in bed No. 62 before midnight on June 6th admits of little doubt. The period of incubation can therefore be fixed as from midnight on June 6th to 4 P.M. on June 9th, a period of 64 hours.

*The Other Cases.*

The patient in bed 60 had a compound fracture of the humerus, the temperature had been normal for the past 14 days. On the morning of June 11th he had an attack of shivering and the temperature rose to 100°; he had general pains; the temperature fell to normal on the evening of the 12th.

Next to the last patient in bed 59 was a man with a wound of the knee; the temperature had been normal for more than a fortnight. On the afternoon of June 11th the temperature rose to 104°, accompanied by shivering and general aching, followed by cough and expectoration. The temperature fell to normal on the 13th, and a rapid recovery ensued. It may fairly be assumed that these two cases were infected, not by the original importer of the disease, but by his first victim, the patient in bed 61. On this hypothesis the period of incubation would be exactly 48 hours in the case of No. 59 and some six hours less in the case of No. 60.

The patient in bed 64 adjacent to one of the first cases suffered from a gunshot wound of the chest (non-penetrating) which, however, had not given rise to any degree of fever higher than 99°. On June 11th the temperature rose to 103° with cough; crepitations were audible at the left base. Next day a small area of consolidation was observed at the angle of the left scapula. The temperature fell, followed by a secondary rise, accompanied by signs of a small patch of consolidation at the right base. Rapid resolution took place at both bases, the temperature falling to normal on the sixth day.

Assuming this case to have been infected from his left-hand neighbour, No. 63, who was a bacteriologically proved case, the period of incubation would be exactly 48 hours.

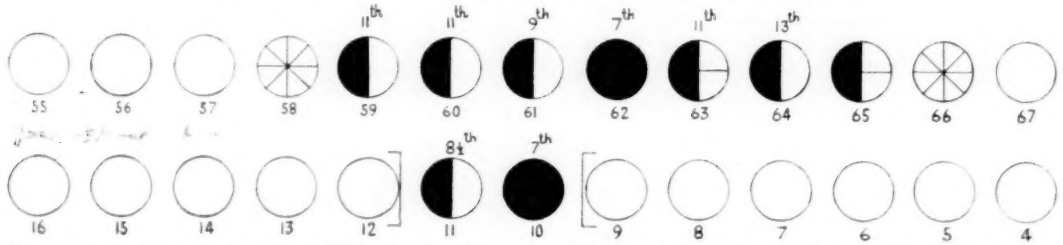
The patient in bed 65, the right-hand neighbour of last-mentioned case, had been in hospital suffering from inflammation of the connective tissue of the feet. His temperature had not been above 99° during his stay in hospital. On the morning of June 13th his temperature rose to 100°, and for the next 48 hours it ranged between 99° and 100°, until on June 15th it rose to 103°. The left base showed signs of consolidation, the pneumonic process spreading to the right base two days afterwards. Pfeiffer's bacillus was recovered from the sputum. In this case resolution was delayed, fever and signs of consolidation persisting. Exploration yielded no fluid until the sudden expectoration of a large quantity of purulent sputum and the appearance of the signs of a cavity at the left base indicated the presence of a pulmonary abscess. X rays confirmed this diagnosis. The sputum contained pneumococci, but in the later stages *B. Pfeiffer* could not be recovered.

This patient made a good recovery. Assuming this case to have been infected from his right-hand neighbour, the period of incubation proves to be almost exactly 48 hours.

In this group of seven cases there were four distinct periods of infection, this infection beginning at the centre bed 62 and spreading from bed to bed on either side. In every case, moreover, the infection spread directly from bed to bed; in no case was the orderly sequence of a systematic march departed from. The limitation of the series is in all probability attributable to the fact that two beds, Nos. 66 and 58, stood empty during the whole epidemic.

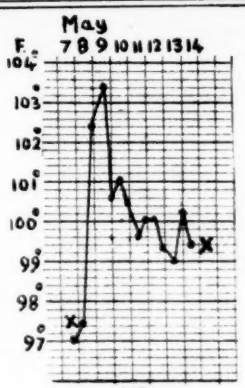
Two cases occurred on the opposite side of the ward, which are shown in the diagram as Nos. 11 and 10.

*Diagram of Beds in a Surgical Ward of a Military Hospital.*

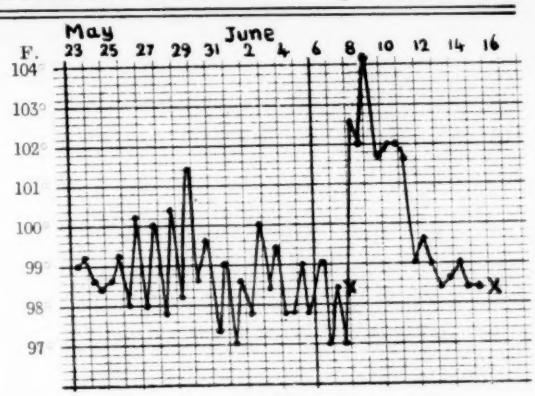



The diagram illustrates the narrow radius within which infection from influenza takes place. The infection began from Bed 62 into which a man suffering from bronchitis was admitted on June 6th. Adjoining and opposite bed-fellows were stricken with influenza on the dates shown. Key to Diagram appears on opposite page.

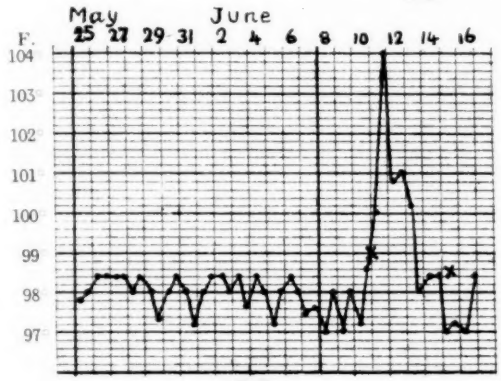
*Temperature Charts of an Epidemic of Influenza localised in a Surgical Ward. The bold number at the foot of each chart refers to the position of the bed as given in the diagram. The crosses on the charts denote the beginning and end of the influenzal febrile movement.*



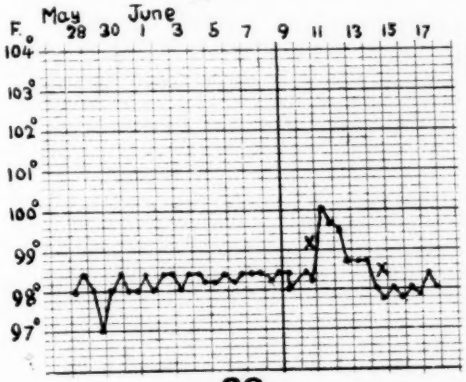

10



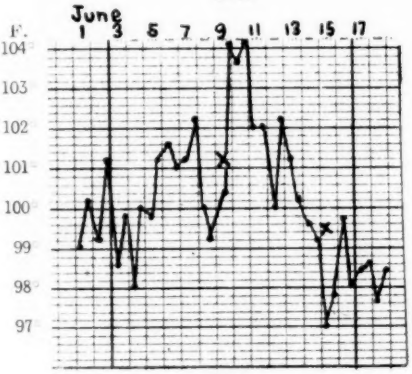

11



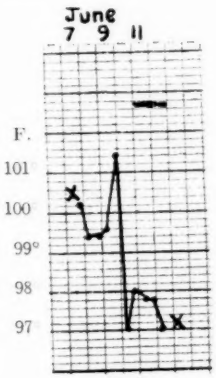

59



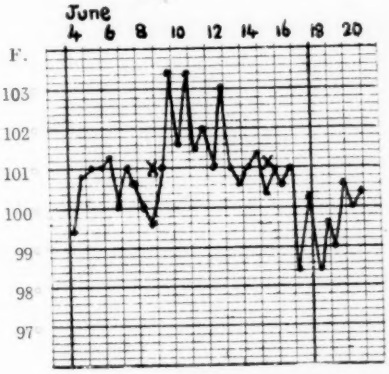

60




61




62




63

*Key to Diagram.*

= Ordinary surgical case.

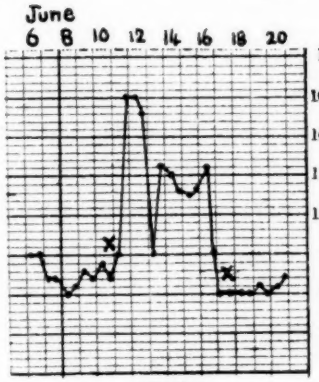
= Medical case with "influenza."

= Surgical case infected.

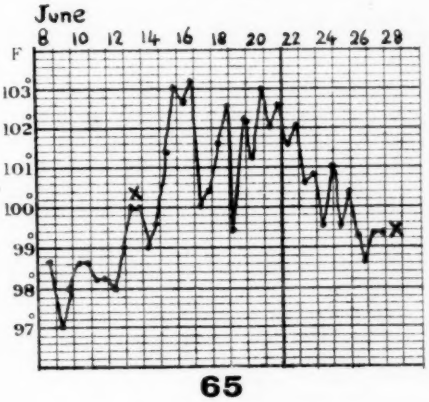
= Surgical case infected. *B. influenzæ* found.

= Vacant beds.

= Splinting, pulleys, &c.




64




65

It is difficult to be sure whether No. 62 on the opposite side was responsible or whether No. 10 was himself infected before admission to the hospital. This case was a medical case admitted under similar circumstances to No. 62—namely, pressure on medical beds due to the general epidemic. This man was a slight gas case and was admitted about midnight on the 6th, afebrile on arrival, but had a sudden rise of temperature at 12 P.M. on the 8th, a period of 48 hours after admission. His ailment showed pyrexia, rhonchi, and crepitations at the left base. His recovery was rapid, the laryngitis, due to gas, remaining unaltered during the whole period. His left-hand neighbour, No. 11, suffered from fracture of the right and left humerus, and this case had a sudden rise of temperature on the 8th, shivering and coryzal symptoms, and an ear discharge. This cleared up very rapidly. The incubation period was between 35 and 40 hours.

The limitation of spread from these cases may be explained by the fact that although the beds were occupied, yet elaborate cross-pieces for splints materially increased the space between the beds, thus interposing the barrier to further spread.

*Summary.*

The ailment from which all these cases were suffering appears without doubt to be influenza, both from the positive bacteriological results in two cases out of nine and also from the clinical observations. As regards the latter, it is interesting to note that the following symptoms were presented by one or other case, and that the duration of the illness was either long or short: (1) septicæmia; (2) coryza; (3) bronchitis; (4) broncho-pneumonia; (5) otitis media; (6) body pains, &c. In all these cases the incubation period was about 48 hours, the cases in which possibilities of accurate observation were greatest were those which approximated most closely to a 48-hour period.

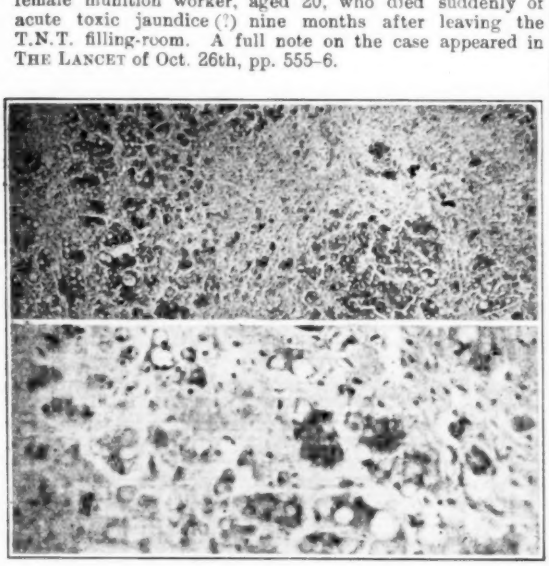
These observations illustrate two factors in the spread of influenza. Firstly, the narrow radius within which infection takes place; secondly, the shortness and apparent punctuality of the incubation period. Both these factors help to explain the rapid spread of epidemic influenza.

SUPPLEMENT TO A NOTE ON

## "ACUTE YELLOW ATROPHY" (?).

BY ERNEST GLYNN, F.R.C.P. LOND.

THE following microphotographs illustrate the condition of the liver on microscopical examination in the case of the female munition worker, aged 20, who died suddenly of acute toxic jaundice (?) nine months after leaving the T.N.T. filling-room. A full note on the case appeared in THE LANCET of Oct. 26th, pp. 555–6.



Upper half.—Section of liver, × 150, showing large necrotic areas and portions of persisting but fatty lobules.
Lower half.—Section of liver, × 400, showing (right quarter) unusually cirrhotic area and (left bottom corner) necrotic area. Fatty liver cells are also seen

# Medical Societies.

## ROYAL SOCIETY OF MEDICINE.

### SECTIONS OF MEDICINE, EPIDEMIOLOGY, AND PATHOLOGY.

*Encephalitis Lethargica.*

A COMBINED meeting of these sections was held on Oct. 22nd, Surgeon Rear-Admiral Sir HUMPHRY ROLLESTON, President of the Society, being in the chair, when a discussion took place on Encephalitis Lethargica, a brief note on which has already appeared in our columns.

*Pathology.*

Lieutenant-Colonel F. W. MOTT, R.A.M.C. (T.), gave a résumé of the results of the examination of two brains which was sent through him by M. Marinesco, professor of neurology at Bucharest, who had been working for some time past in the pathological laboratory of the Maudsley Neurological Clearing Hospital. Disseminated miliary or punctiform hæmorrhages visible to the naked eye existed in the grey matter in the neighbourhood of the floor of the fourth ventricle, the aqueduct of Sylvius, and even the third ventricle, and were also found in the posterior part of the pons and the peduncles. The cerebral cortex, except for congestion of some of the vessels of the lepto-meninges, had shown in these two cases neither macroscopic nor microscopic lesions. On the contrary, the first segment of the spinal cord, which was the portion of the cord available, had presented the same histological lesions as the pons, bulb, and peduncles. Microscopical study of the above-mentioned regions had demonstrated the existence of four kinds of lesions: 1. Infiltration of the walls of the small vessels, and especially the veins, consisting of lymphocytes and plasma cells in the adventitia, disposed in several layers. The endothelium and fibroblasts might also take part in the inflammatory process. 2. Foci of interstitial inflammation consisting of neuroglia cells of several kinds, including large cells with voluminous excentric nucleus and many fibrillar prolongations, lymphocytes, and polynuclears. The foci of interstitial inflammation appeared sometimes to be altogether independent of vascular infiltrations, and might occur in the roots of the nerves—e.g., hypoglossal, pneumogastric, &c. 3. Lesions of the nerve cells, which did not correspond with those usually seen in infantile paralysis. There was dissolution of the *soi disant* Nissl bodies, relative achromatosis, reduction in volume of the cellular body and of the number of prolongations and multiplications of the satellite cells, but only exceptionally was there evidence of neuronphagia, as was described by Economo. 4. The foci of hæmorrhage, the most obvious microscopic change, were seen to be much more numerous when microscopic examination was made. These hæmorrhagic foci remained circumscribed around the walls of the small vessels, and red corpuscles were mingled with the cells of inflammatory infiltration, or they constituted a kind of covering and floated about around the vessels. In spite of the very great number of hæmorrhages the vessel wall did not appear to be necrosed, but sometimes a solution of continuity of the vessel wall could be seen. From microscopic investigation of these two cases, M. Marinesco drew some conclusions upon the nature of the disease. He regards lethargic encephalitis as a disease entirely different from botulism, from the hæmorrhagic poliomyelitis of Wernicke, from the poliomyelitis of Heine-Medin, and from sleeping sickness. Like these two last diseases, it was an infectious inflammatory disease, but the nature of the infectious germs had not yet been determined. It was distinguished from botulism by its symptomatology and by the four above-mentioned histological lesions. The vascular lesions, due to the presence of an infiltration of the walls of the vessels by migratory elements, were absent in botulism, and the readily recognisable *Bacillus botulinus* had not been found in these cases. Colonel Mott then showed photomicrographs illustrating the chronic inflammatory conditions of the perivascular lymphatics in sleeping sickness and cerebro-spinal syphilis, in which there was definite infection by a specific organism, and which might be accompanied by somnolence. In

epidemic encephalitis and the bulbo-pontine encephalitis of Heine-Medin disease, which, as Wickman had shown, was a form of anterior poliomyelitis, somnolence was a frequent symptom, passing on to coma. Epidemic encephalitis was an acute inflammation of the sub-adventitial perivascular lymphatics, and was characterised by naked-eye hæmorrhages in the pons, the medulla, the peduncles, and around the third ventricle. Microscopic examination showed not only lymphocytes and plasma cells in the lymphatic sheaths of the arteries and veins, but large numbers of polynuclears, and the inflammation was so acute that there were hæmorrhages, not only into the lymphatic sheath and peri-adventitial space, but into the tissues around. There was proliferation of neuroglia cells around the vessels and in the nervous tissue in the proximity of the inflamed vessel. He could find no essential difference between this epidemic encephalitis with its characteristic clinical symptoms of fever, headache, oculo-motor, facial and bulbar symptoms of difficulty in swallowing, paralysis of soft palate and respiratory symptoms, and the ponto-bulbar encephalitis of Oppenheim and Cassirer, and observed frequently in the epidemic described by Wickman. In the Heine-Medin disease, as in cerebro-spinal syphilis, different forms arose according to the maximum seat of the lesion, and this might be explained by supposing that the primary seat of invasion of the lymphatics of the nervous system varied in different cases and in different epidemics. Thus, the spinal cases might start from the intestines and find access to the spinal cord by the lymphatics surrounding the lumbo-sacral arteries; lesions in the bulbo-pontine and upper spinal region might start from infection of the lymphatics surrounding the vertebral artery when the throat and nose was the primary seat of invasion of the peri-arterial lymphatics, or by the infection of the internal carotid when in the encephalitic or meningeal forms. It was said that this epidemic of ponto-bulbar encephalitis could not be the same as Heine-Medin disease, for the cerebro-spinal fluid obtained by lumbar puncture contained no lymphocytes. Captain C. R. Box had had cases in which lymphocytes had been found. It appeared that when the meninges were affected lymphocytes and albumin were certain to appear in the cerebro-spinal fluid.

*Observations on Blood Counts and Cerebro-spinal Fluid.*

Dr. P. N. PANTON said that the examinations made of cases in the clinical laboratory of the London Hospital consisted in investigations of the leucocytic content of the blood and the protein and cellular contents of the spinal fluid. The results were compiled and published by his colleague, Mr. S. K. Vaidya, in THE LANCET of Sept. 7th, 1918, and he proposed to give very briefly a summary of these findings. Twenty of the most typical cases were examined, and it was probable that the diagnosis was incorrect in two only. In both these cases the error in diagnosis was indicated by the laboratory examination. One case had a leucocytosis of 21,200 per c.mm., by far the highest count of the series, and proved to have lobar pneumonia. In the other tubercle bacilli were found in the spinal fluid during life and miliary tuberculosis post mortem. In the remaining cases the average leucocyte count was 7600 per c.mm., and the relative proportions of the cells were about normal. An occasional somewhat higher leucocyte count was explained by the presence of a septic rash or some other complication. The spinal fluid was in all cases clear and without any coagulum on standing, such as was found in tuberculous cases. The protein was never more than slightly increased, and the cellular content was either normal or slightly increased also, the type of cell being always lymphoid. In some cases he thought that the protein excess, which, though not great, was constant, was greater than should have been expected from the small number of lymphocytes found. Although these changes were very slight they appeared to them to be constant. The value of leucocytic, and in particular of spinal fluid, examinations as a means of *excluding* diagnoses of epidemic encephalitis was abundantly manifest in numerous cases of other diseases occurring during this epidemic, but not included, with two exceptions, in the series.

Dr. F. G. CROOKSHANK said that in describing the cerebro-spinal fluid examination it was necessary to state the day of the disease on which the fluid was taken, as the cell count, &c., differed from day to day.

*Epidemiology.*

Dr. W. H. HAMER pointed out that just as in 1915 the so-called epidemic of cerebro-spinal fever was really only a small part of an influenza prevalence, so in the epidemic encephalitis of the spring of 1918 a particular cluster of symptoms was once more being singled out for scrutiny, and that here, again, the epidemic, so-called, was merely part and parcel of a prevalence of influenza. During the last ten years evidence had been collected, however, clearly showing a close association between outbreaks of poliomyelitis, polioencephalitis, cerebro-spinal meningitis, and prevalences of influenza. He referred to Brorström's demonstration of the influenzal nature of poliomyelitis, to the London evidence relating to the common origin of cases of influenza and of cerebro-spinal fever, and to the similar conclusions arrived at by an Army bacteriologist from study of the 1915 outbreak in camps. The proof that epidemic lethargy was no new disease was writ large in Hecker and in Creighton,[1] and was now being followed out in detail by Dr. Crookshank in his Chadwick lectures in course of being delivered. In spite of all this there was a disposition, in some quarters at the present time, to claim that the epidemiological teaching must be brushed on one side, and reliance placed exclusively upon niceties of laboratory technique. In view of the fact that "Spanish influenza" had followed hard upon the heels of epidemic encephalitis, he ventured to plead, once again, for the epidemiological point of view. These "new diseases" could not be completely understood by making cell counts and cultivating various strains of organisms; nor fully comprehended by insisting upon the fact that particular structures had been picked out in the cerebro-spinal nervous system, and that the lesions were here at one level and there at another; nor satisfactorily explained by focusing attention upon some particular sign or symptom, whether it were sweat, lethargy, paralysis, an exanthem, or some evidence of involvement of the pulmonary, nervous, or gastro-intestinal systems, and by considering each phase of the epidemic prevalence in relation thereto and studying it apart from all the other phases. Recognition of the epidemiological point of view really implied, he submitted, a return to Sydenham's method. Creighton had declared that there was something more than accident in the association between epidemics of influenza and epidemics of "ague." Study of the last named showed clearly that they were not, of course, outbreaks of malaria, but precisely those very gastro-intestinal, pulmonary, and nervous manifestations which we were now beginning to realise actually constituted part and parcel of influenza prevalences.

*Report of Local Government Board.*

Lieutenant-Colonel S. P. JAMES (Local Government Board) said that Sir Arthur Newsholme had authorised him to give a brief summary of the results of an inquiry into encephalitis lethargica recently carried out by the medical staff of the Local Government Board in collaboration with the Medical Research Committee. Owing to printing difficulties the issue of the report of this inquiry had been greatly delayed. The summary he gave was abbreviated from Sir Arthur Newsholme's general review which prefaced the report. In its initial stages last April the inquiry was concerned chiefly with an investigation of the hypothesis that the illness was a manifestation of botulism. In connexion with that view Dr. J. McIntosh, on behalf of the Medical Research Committee, carried out a complete bacteriological investigation, and Dr. G. C. Hancock and Dr. Pearse, of the Food Branch of the Board's Medical Department, personally investigated, from the point of view of a possible food origin, 58 cases reported up to May 7th. The result of these preliminary inquiries was that neither on the bacteriological nor on the epidemiological side could any direct or indirect evidence be obtained of an association of the illness with the *Bacillus botulinus* or with infection from food. In addition to proving that the illness was not due to food, the results of the preliminary inquiry pointed to a possibility that it might be one of the many forms of the disease, or group of diseases, to which nosologists at present attach the indiscriminative label "Heine-Medins'che Krankheit," of which infantile paralysis—officially termed acute poliomyelitis—was the commonest

[1] THE LANCET, 1906, i., 569, 655, 733.

type of illness. It was found, however, that from infantile paralysis the present illness differed very strikingly, not only in the localisation of the paralysis and some other equally obvious signs, but in its age incidence, seasonal prevalence, course, duration, and fatality.

In these circumstances it was decided to carry out a more complete clinical and epidemiological study of the illness than had been attempted in regard to the first 58 cases. The Public Health Department of the London County Council agreed to investigate all cases in the London area. Up to the end of June the number of cases in the London area inquired into was 107 and the number in the provinces was 121. Apart from these special inquiries Dr. A. S. MacNalty was deputed to undertake a detailed personal study of the clinical symptoms of the illness, conferring with Sir William Osler, Regius professor of medicine, University of Oxford, and with Major George Draper, of the United States Army Medical Corps, who examined and reported on cases in Birmingham, Leicester, Oxford, and other localities. On the bacteriological side, in addition to the research in connexion with a possible food origin, the problem of the nature of the illness was attacked from the point of view that the virus might be closely allied to, or perhaps identified with, that of acute poliomyelitis; and in this line of research animal experiments were begun as soon as the necessary monkeys could be obtained. In addition Sir Walter Fletcher, F.R.S., secretary to the Medical Research Committee, secured the services of Professor G. Marinesco, of Bucharest, for the examination of specimens from fatal cases of the disease.

*Results of Investigations.*

The accounts given by all these observers might be summarised very briefly as follows: 1. For identification and description it was decided to follow von Economo in terming the illness encephalitis lethargica, a name which had the right of priority and indicated a characteristic clinical feature. 2. Dr. MacNalty, from his clinical study, concluded (*a*) that in its essential primary features the illness had a characteristic and constant symptom series of its own; (*b*) that between this symptom series and that of the rare forms of poliomyelitis with which alone it could be confused the clinical differences were more marked than the resemblances. 3. The results of the epidemiological inquiries were to the effect that encephalitis lethargica was not a form of acute poliomyelitis, and that its presence and epidemic prevalence depended on conditions other than those necessary for the presence and epidemic prevalence of that disease. 4. Both Professor Marinesco and Dr. McIntosh, as a result of their separate researches, arrived independently at the conclusion that encephalitis lethargica, as it appeared in the present outbreak, was identical with the illness described by von Economo in Austria and Professor Netter in France, and that it was a disease sui generis anatomically and clinically distinct from analogous affections.

It still remained to ascertain what the nature of the disease was rather than what it was not. Various hypotheses had been suggested by different workers engaged in the inquiry, but the view which appeared best to agree with present knowledge was that encephalitis lethargica was one of a group of diseases in which, as in cerebro-spinal fever and acute poliomyelitis, the pathogenic agent was much more generally present in the human organism than the clinical evidence implied. As regards cerebro-spinal fever this was no longer an hypothesis, but a well-established observation. In that condition the specific reaction named cerebro-spinal fever arose in one or other of two ways: first, as the result of a breakdown in the immunity to the effects of the virus which the individual who harboured it had up to that time enjoyed; secondly, as the result of a non-immune person becoming infected with a strain of the virus which had attained the degree of pathogenic action described as specific. During severe epidemics evidence could sometimes be obtained that cases of cerebro-spinal fever arose in both these ways, but during inter-epidemic and mild epidemic periods it was seldom or never possible to obtain evidence that the illness was infectious: at such times cases of the disease were always scattered sporadically, and, except the patient himself, they cannot be traced to any known source of infection.

This was the view that best explained the irregular, widespread, sporadic distribution of encephalitis lethargica. Until further research yielded precise information we might assume that many people harboured the organism of the illness—perhaps as a harmless saprophyte, perhaps as a "conditional parasite," perhaps in the stage when it must be termed a "specific pathogenic" parasite—and that in certain of these persons there occurred for some unknown reason either an enhanced virulence of the parasite or a lowered resistance of the tissue cells, or both, the result being that the stimulus of the parasite overcame the resistance of the tissue cells and the host suffered from the effects of the virus which previously he had harboured with impunity. This explanation implied that the key to the problem rested not in the purely bacteriological view of the causation of disease, but in the wider view that disease resulted from the interaction of several factors of which changes in the properties of the tissue cells on the one hand, and in the provoking stimulus or pathogenic agent on the other, were the chief. The view emphasised the rôle of the individual in the origin and progress of the disease, and the practical indication would seem to be to enlist all the resources of personal and public hygiene in an endeavour to influence favourably the potential energies of body and tissue cell resistance, especially in individuals who might seem to be predisposed to a disease of this nature if they happened to become a host of its parasite. At the same time, it was clearly of importance to pursue research, both to ascertain what pathogenic agent was concerned and into the factors of individual predisposition and correlated resistance, the variations of which were subject to so many influences. The first necessity for these studies was early and complete information of all cases of the disease in different parts of the country, and for this reason the Local Government Board had decided, as a temporary measure, to make encephalitis lethargica compulsorily notifiable for a period of one year.

Colonel James then reviewed briefly the relevant epidemiological data collected up to the end of June, and thought that the evidence adduced, in both quantity and kind, supported the conclusions (1) that the illness under consideration was not a form of acute poliomyelitis; (2) that its presence and its prevalence in epidemic form depended on conditions other than those necessary for the presence and epidemic prevalence of that disease. He displayed charts comparing the seasonal incidence of poliomyelitis and encephalitis lethargica and maps comparing the distribution of the two diseases.

*Description of the Disease.*

Dr. A. S. MACNALTY described the condition of encephalitis lethargica occurring in the recent outbreak as an acute illness in which nervous localising signs might or might not be present. There were three types: 1. A type displaying general disturbances of the functions of the central nervous system but without localising signs. 2. Types with nervous localising signs: (*a*) clinical affection of the third pair of cranial nerves; (*b*) affections of the brain stem and bulb, with local lesions of other cranial nerves; (*c*) affections of the long tracts—e.g., pyramidal, pre-pyramidal, and upcoming afferent tracts; (*d*) ataxic types (involvement of cerebellar mechanism); (*e*) affections of the cerebral cortex; (*f*) types indicating some evidence of spinal cord involvement; (*g*) polyneuritic type. 3. Mild or abortive types, with or without localising signs in the central nervous system. The *incubation period* was probably variable. The *prodromal period* commonly ranged from the first to the seventh day, but might be as protracted as three weeks, during which occurred lethargy, headache, giddiness, and diplopia, as well as lassitude, fatigue, vomiting, and diarrhœa. *The acute manifestation* included slight early rise of temperature (to 101° or 102° F.), marked asthenia, catalepsy, stupor (alternating with nocturnal delirium), emotional changes, changes in speech (which became either nasal, monotonous and slurred, or chattering, rapid and unintelligible), fibrillary movements, and choreic movements of face, trunk, and limbs. Muscular pains, hyperæsthesia, retention or incontinence of urine, incontinence of fæces, sweating, skin eruptions, and dysphagia might also occur. Marked constipation was the rule. The rapid, complete, or partial clearing of the paralysis was the most remarkable feature of the types with nervous manifestations. Mild or abortive types were rare. Recovery was gradual and tedious, chiefly on account of the great prostration and muscular weakness. Death appeared to be due to paralysis of the respiratory centre in the medulla, and was preceded by intensification and frequency of delirious attacks, deepening of the stupor, and coma. After-effects noted were:

(1) alteration in the mental condition; (2) persistence of cranial nerve palsies; (3) the subsequent appearance of paralysis, apparently of spinal origin; and (4) athetosis. He concluded that, though the disease resembled poliomyelitis, it differed from it in important respects and displayed characteristic symptoms. It was possible that the accepted classification of poliomyelitis had been made on too wide a basis, and certain cerebral, ponto-bulbar, and ataxic types might have been examples of the clinical forms observed in this outbreak. Cases of poliomyelitis and encephalitis had been known to occur side by side. He thought the relationship between them might be comparable to that existing between typhoid fever and paratyphoid.

*Clinical: A Series of 16 Cases.*

Lieutenant-Colonel A. J. HALL spoke of his experience of 16 undoubted cases which came under his immediate observation. The epidemic in Sheffield differed from the whole, in that there was not one fatal case throughout. His cases included persons of each decade up to 70 years. Only two were under 10 years. The sexes were about equally represented. The epidemic began early in March, and was practically over by the end of April. The *mode of onset* varied considerably. In five the onset was sudden, in the remainder it might be described as gradual.

*Symptoms and signs.*—The three cardinal signs in a typical case were *lethargy*, *general asthenia*, and *cranial nerve palsies*. One or even two of the cardinal signs might be slight or absent, but as a rule the clinical picture was chiefly due to the asthenia and lethargy. In one of the cases the lethargy was slight and the cranial palsies limited to a slight ophthalmoplegia, but the general asthenia was so extreme that the patient gave a typical picture of immobility, being unable to turn over in bed and hardly able to move arms or legs. Another case within 24 hours developed almost complete facial diplegia, whereas there was no lethargy or asthenia throughout. He emphasised the importance of considering the three cardinal signs as a whole; any one of them might predominate or might be slight or absent. In most cases the cranial nerve palsies formed but a small part of the whole symptom-complex.

*Prodromal period.*—In most cases there was a distinct interval between the onset of illness and appearance of characteristic symptoms, and this varied widely. It was usually a few days—about one, to four or five—but in some of the cases had been not less than 10 days. The onset of the cardinal signs might be sudden, but was usually ingravescent, and this was particularly true of the cranial palsies. They took some time to develop fully, and might vary in extent from day to day. The general asthenia tended to make the facial palsies less obvious than usual. *Ophthalmoplegias.*—Strabismus of variable extent, inequality of pupils, and nystagmus were commonly present. The last named was sometimes of an irregular and incoördinate kind. *Fever* was noted in many cases, sometimes severe and prolonged, but might be slight, even in a severe attack. *Lethargy* was perhaps the most striking feature of most of the cases. It was not true sleep. Often the patient was surprisingly awake to what was going on. Many who were stuporose all day became delirious at night, returning to stupor next day. Sometimes the delirium was of a foolish kind and suggested hysteria. *Tremors.*—In one case tremors with asthenia were the chief symptoms. *Speech.*—During the lethargic period this was often affected. In one case there was a distinct hurried or festinating speech, such as is sometimes observed in paralysis agitans.

*Results.*—All the 16 cases were still alive, most had been seen within the past few days, and reports from their medical attendants had been received of others. Group A consisted of 7 cases in which recovery was complete and absolute. Group B contained 6 cases in which recovery was practically complete, some slight trace of illness being left behind. In Group C there were 3 cases, and these after six months were still far from recovery. In each case the present incapacity was due to involvement of the trunk and limb muscles generally, the cranial palsies having disappeared completely or almost so.

The points for discussion might be summed up as follows: Was this or was it not an epidemic of poliomyelitis? If it was not, then it might be either an entirely new disease or one that until recent times had not been observed in epidemic form. Lethargy and asthenia, so severe and prolonged in most of the cases of encephalitis, had not been recorded as occurring in typical cases of poliomyelitis, sporadic or epidemic. He could not think that anyone would consider the term "sleeping sickness" descriptive of poliomyelitis in general, yet it would not be an inappropriate name for this epidemic. Except for the palsies there remained little in these cases of encephalitis which was common to them and to poliomyelitis. Even the palsies presented striking differences in the two diseases. In poliomyelitis the onset tended to be rapid and maximal; the regions affected were usually those innervated from the spinal cord; the distribution was often unilateral, and they frequently left permanent residual effects of greater or less extent in the areas first attacked. In the recent epidemic the paralyses were typically of gradual ingravescent onset; they almost always affected regions innervated by cranial nerves and were often bilateral. So far as present evidence was available they usually left no permanent residual effects in the area first affected. We knew that many nerve poisons—e.g., diphtheria, *B. botulinus*, lead, alcohol, &c.—showed a peculiar predilection for certain particular parts of the nervous system; in these cases of epidemic encephalitis there seemed to be such a definite selective action at work. It had been pointed out that poliomyelitis in its epidemic form was characterised by the multiformity of the sites affected. The cases of the recent epidemic were notable for the uniformity of the sites affected. With regard to the possibility of this being an old disease which had only recently been recorded in epidemic form he had no proof to bring forward. A similar epidemic appeared about the same time in 1917. In course of time records of sporadic cases of a similar type might be found as abnormal or exceptional varieties of influenza or poliomyelitis, &c. Such a line of inquiry seemed worth consideration, but in any case the final decision rested with the pathologist. Photographs were displayed on the epidiascope to show the mask-like countenance, the lethargy, and the posture of patients in bed.

*Statistical Observations on 127 Cases.*

Dr. CROOKSHANK gave statistics of 127 cases observed by him early in this year, and considered by him examples of Heine-Medin disease, 120 occurring at the London Hospital, 4 at the North-West London Hospital, and 3 private cases. Of these, 77 were males and 50 females. Under 5 years there were 28 cases (17 males and 11 females); from 5 to 10 years 29 cases (16 males and 13 females); and over 10 years 70 cases (44 males and 26 females). There were 26 deaths (or 20·39 per cent.), and 11 post mortems were performed.

*Cerebro-spinal fluid.*—In 51 cases lumbar puncture was carried out, and in 44 cases the cerebro-spinal fluid was examined. In 43 cases cytological reports were made. In 25 cases lymphocytes and in 4 cases leucocytes were found in excess. In 6 cases lymphocytes and in 2 cases leucocytes were in marked excess. Protein was present in excess in 26 cases. Organisms were found in 16 cases, no organisms in 12, Gram-negative organisms in 2, and Gram-positive in 2 cases.

*History and mode of onset.*—A history of injury to the head occurred in 9 cases, of tooth extraction in 2. There was a two-stage history in 46 cases, sudden onset of nervous symptoms without previous illness in 36, gradual onset of nervous symptoms in 17, whilst the onset was undetermined in 28.

*General symptoms.*—Sweating was marked in 13 cases, diarrhœa in 7, and constipation in 29 cases. Glycosuria occurred (without previous history of it) in 1 case, acetonuria in 4 cases. At the onset vomiting occurred in 38, pain in hypochondrium in 13 cases. *Rashes* occurred in 27 cases, erythematous in 12, miliarial in 2, petechial in 5, and herpes in 8 cases, and of these 6 were labial and 2 gluteal. Desquamation was observed in 2 cases, joint swelling in 2 cases, œdema of the legs in 1 case, enlargement of glands of head and neck in 1 case, and bedsores occurred in 1 case. Dental irregularities were not positively recorded in more than 10.

*Signs and symptoms referable to nervous system: Mental.*—Emotionalism or "hysteria" was marked in 5 cases. Mutism (apart from silence during drowsiness) was noted in 7 cases. Delirium was marked in 19, maniacal delirium noted in 2, "acute delirious mania" following "stupor" in 1, delusions or hallucinations (apart from delirium or mania) in 3 cases. Nocturnal sleeplessness with diurnal drowsiness was marked in 3 cases, "drowsiness" in 30, stupor or prolonged lethargy in 26, "unconsciousness" or

coma in 25, and sequential dementia in 5 cases. *Physical.*—Epileptiform fits or convulsions were present in 15 cases; tremors, twitching, or choreiform movements were marked in 22 cases, trismus was marked in 2, head retraction was marked in 23, and limb spasticity was marked in 29 cases. Paresis or paralysis of limbs (apart from general asthenia) occurring transitorily or otherwise without hypertonia was noted in 47 cases, atrophy of limb muscle groups (apart from generalised muscular atrophy) in 10, facial paralysis (other than transitory) in 8, amaurosis (partial or marked) with slight changes in papilla in 5, ptosis was marked and persistent in 23, strabismus occurred in 19, nystagmus in 14. Deafness and tinnitus were marked in 5, dysphagia occurred in 5, hypoglossal palsy was marked and persistent in 5, pain and tenderness in limbs were marked in 11, and formications, tinglings, and numbness were marked in 6. In 6 cases ascending paralysis occurred, and in one case (not included in the above statistics) trophic changes and gangrene of the finger-tips appeared, probably due to an acute ascending central myelitis.

A very careful inquiry had convinced him that the various Heine-Medin categories—paralytic, spasmodic, and psychical—had been known in Europe for many centuries. Their prevalences or recurrences (pandemic, epidemic, endemic, communal, or commensal) had invariably been associated, concurrently or coincidently, with wider but similar prevalences or occurrences of catarrhal, sudoral, or nervous fevers, now generally regarded as influenzal. The cases spoken of as "infantile paralysis" represented only one end of a spectrum.[2] The other end was represented by various forms of "encephalitis," including the "acute delirious mania" of Dr. Luther V. Bell.

*Discussion.*

Sir ARTHUR NEWSHOLME pointed out that diseases which might occur in conjunction with each other and under similar epidemiological conditions were not necessarily the same.

Lieutenant-Colonel GOODALL agreed with Dr. Hamer that this disease was the same as that described by Sydenham, who also called it "the new disease." The duty of pathologists, clinicians, and epidemiologists was to separate diseases. Diseases which were similar were not necessarily identical.

Dr. CROOKSHANK drew attention to the fact that "poliomyelitis" attacked a part of the organism which in children was in an early stage of development—namely, the anterior horn cells. This might be the reason why growing children developed flaccid atrophy in a manner which did not appear in grown-up people. The child grew and developed, whilst the anterior horn cells remained stationary.

Dr. F. BUZZARD said that encephalitis in children was more common than was generally recognised. He had seen two cases of encephalitis lethargica which at first sight appeared typical of paralysis agitans. If the mid-brain were attacked cases of the paralysis agitans class were produced.

Captain BOX said that he had seen a case of encephalitis lethargica in 1913, with typical clinical findings and post-mortem lesions as described by Colonel Mott. Out of 14 cases in which he had had cerebro-spinal fluid examined 6 showed excess of lymphocytes, 6 showed blood, and 2 were negative. In no case was the fluid under pressure. Two cases had rashes, pustular in one case and in the other like measles, but with a different distribution. There was one case of optic neuritis. In three cases there were false attitudes of the head, showing a deviation from one or other shoulder produced by some interference with the peduncular system.

Dr. J. A. MURRAY, Captain DA FANO, and Dr. H. INGLEBY also spoke.

## SECTION OF SURGERY.

*Spolia Opima.*

A MEETING of this section was held on Oct. 23rd, when Sir JOHN BLAND-SUTTON delivered his Presidential address, in which he gave demonstrations of museum specimens. Speaking of abdominal surgery, he said that in many cases operation left the patient in a worse state than before. This also applied to gastric surgery, about which nothing had been learned since 1881, when surgeons took up the surgery of the stomach. Less than a hundred years ago simple gastric ulcer was confounded with carcinoma. Bilocular stomachs used to be of interest in the post-mortem room, or were a curiosity of the museum. When Darwin came on the scene they became of interest to anatomists and were regarded as a result of atavism. They were now known to be very common and the result of disease. He had operated on three cases in which the stomachs were joined by a very small isthmus. The isthmus was removed and the stomachs were joined, but the patients were unrelieved and gastrojejunostomy had to be performed. The contracting influence had apparently persisted after the operation. He gave a review of surgery since the time of Hunter, and described the amount of suffering supported by patients before the introduction of anæsthetics, and remarked upon the extraordinary skill and quickness of operations of the surgeons in those days.

[2] THE LANCET, 1918, i., 699.

## SOCIÉTÉ DE BIOLOGIE, PARIS.

THE meeting of this society on Oct. 19th was the first of a series of inter-Allied gatherings devoted to the Biology of War. The subject chosen was Shock, and the following is a summary of some of the papers read:—

W. B. CANNON: The Origin of Traumatic Shock.

Le choc traumatique est caractérise par pression artérielle basse persistante, pouls accéléré, paleur, sueurs, respiration superficielle rapide. Pression artérielle basse persistante n'est due ni à faiblesse cardiaque, ni à manque de tonus vaso-constricteur. Hyperglobulie dans les capillaires accentuée par le froid. Réduction de la réserve alcaline parfois assez forte pour déterminer l'acidose; elle est due à l'abaissement exagéré de la pression sanguine qui amène l'anoxhémie. Si la pression sanguine est demeurée basse longtemps, impossibilité de la relever: les cellules nerveuses étant très sensibles au manque prolongé d'oxygène. Le choc n'est pas du à perte du tonus vaso-constricteur, ni à une embolie d'origine graisseuse, ni à l'acapnie; il est donc du à l'effet du traumatisme tissulaire, c'est à dire origine toxique. En effet les phénomènes apparaissent quelques heures après la blessure, même quand les conductions nerveuses sont supprimées, n'ont pas lieu si l'on a soin de supprimer l'irrigation sanguine de la partie blessée, et ils se produisent si l'on rétablit le courant sanguin. Traitement: Rechauffer le sujet; relever pression artérielle: séparer du corps la région traumatisée par garrot ou résection.

QUENU: Shock as an Intoxication.

Le choc est une intoxication dont l'origine est dans la partie blessée; les phénomènes n'apparaissant que 5 à 6 heures après la blessure ne sont donc pas des phenomènes d'inhibition. Il y a résorption de produits toxiques. Quel est le poison? Dislocation de la molécule albuminoide? Poison chimique dans le sang? Observation: Soldat blessé au pied porte un garrot pendant 9 heures; à ce moment excellent état général. On enlève le garrot—trois heures après état de choc.

CANNON cited five similar cases.

PIERRE DELBET: Lessons from Experimental Shock.

Observation: Muscles broyés aseptiquement, injectés dans le péritoine: phénomène de choc. Primitivement, manifestation sur le système nerveux. Secondairement, accumulation des élémen's figurés dans les capillaires, donc ralentissement de l'oxydation, modification de la cellule hépatique. Il faut opérer d'urgence le choqué, la thérapeutique pathogénique étant de supprimer le foyer toxique.

P. DUVAL and GRIGAUT: Nitrogen Retention in Wounded Men.

Il y a chez les blessés augmentation de l'azote résidant du sang. Cette rétention azotée est fonction du degré de désintégration azotée des tissus sous l'influence du traumatisme, ainsi que du degré d'altération de la cellule hépatique. C'est cette rétention qui atteignant certaines limites provoque les accidents toxiques du choc.

LOUET: Injections of Camphor for Shock.

Particulièrement heureux chez les polyblessés, les blessés du segment inférieur, les thoraciques, ces résultats ont été encore plus satisfaisants chez les blessés traités précocement, c'est à dire dans les Postes de Secours. En paraissant voir dans le choc initial un phénomène inhibitoire l'auteur expose les conclusions d'ordre physiologique et chirurgical que ses recherches lui ont permis de préciser. Grâce aux injections intraveineuses d'huile camphrée le chirurgien pourra désormais intervenir plus tôt chez cette catégorie de grands blessés afin d'éviter des graves complications secondaires toxiques ou septiques. Le Médecin Major Louet demande que l'injection intraveineuse d'huile camphrée soit systématiquement pratiquée dans tous les Postes de Secours divisionnaires ainsi que le garrot (indications Cannon), la transfusion sanguine (méthode Jean Brau).

CL. VINCENT: Causes Predisposing to Shock.

L'homme qui se bat perd son tonus. Observation: Après 12 jours de bataille, sur 22 hommes, 14 ont une pression artérielle maximum inférieure à 12. Après deux jours de repos, sur 9 hommes, 6 ont une pression maxima inférieure à 12. Un soldat atteint de néphrite à une pression maxima inférieure à 8. L'homme qui se bat est un hypotendu.

GOVAERTS and ZUNZ: Conditions of Circulatory Collapse.

1. Collapsus post-hémorragique: diminution d'hémoglobine, de globules rouge, de la viscosité. Pression artérielle basse, pression veineuse considérable. 2. Collapsus infectieux: chute de la pression, augmentation de globules rouge, d'hémoglobine, de la viscosité, pression veineuse faible. 3. Collapsus ciseul; traumatique; pas de modification du nombre de globules rouge, du taux de l'hemoglobine, ni de la viscosité, pas de chute considérable de la pression artérielle.

# THE LANCET.

*LONDON: SATURDAY, NOVEMBER 2, 1918.*


## The Influenza Epidemic.

DURING the week the epidemic of influenza, if it has abated in some localities has broken out in others, and on all hands the seriousness of the visitation is being felt. The restraint practised by the daily press in regard to public matters has not survived the temptation to paint this visitation in the tints of the 12 plagues of Egypt, in comparison with which any account of our actual knowledge must appear colourless. In Paris a rumour of cholera arose out of a series of cases with broncho-pneumonia which proved rapidly fatal with general cyanosis, but the Paris rumour is little more lurid than the stories prevalent in London. A natural desire to blame somebody has resulted in an attack upon the Local Government Board for having failed to arrest the development of the epidemic. Furthermore, it is suggested that had a Ministry of Health been in existence there would have been no epidemic at the present time, or, at least, it would never have been allowed to develop. We are in entire accord with those who desire the formation of a Ministry of Health, but we deprecate regarding it as a panacea for all epidemic evils. In the *Times* of Oct. 23rd it is stated that "influenza was very prevalent last summer, and had the experience of the eighties been called to mind it would have been evident that a summer epidemic was likely to be followed by a winter one of greater severity." With this statement we cannot agree. It is contradicted by the Registrar-General's records, which show that summer epidemics are unusual, and that the occurrence of an epidemic of influenza followed by an even more severe epidemic of the same disease within three months is almost unknown. In the 26th, 27th, 28th, 29th, and 30th weeks of this year the deaths from influenza registered in London were respectively 67, 218, 287, 192, and 86; in the 39th, 40th, 41st, and 42nd weeks the corresponding figures were 17, 17, 80, and 371. The experience of all previous epidemics in London is that excessive mortality from influenza in any single epidemic does not continue beyond a period of about six weeks. If this holds good in the present instance we may hope that the excessive mortality caused by the present epidemic will soon begin to decline. There were, however, 1256 deaths in London attributed to influenza in the week ending Saturday last, Oct. 26th.

The experience of London is in large measure that of the rest of the country. It has to be borne in mind that the conditions of living are just now abnormal. The people are suffering from an unusual strain, both mental and physical. Many persons unaccustomed to hard work are engaged in laborious tasks in munition factories and the like; women have replaced men in sundry arduous occupations; few families are without one or more of their members fighting in the deadly struggle on the battlefields of Europe or the Near East, and some, indeed, have already lost their nearest and dearest. Food conditions, too, are difficult, and some persons may be suffering from the effects of overwork and under-nourishment, although, as a matter of fact, the nation in these respects is coming wonderfully well through the ordeal. But circumstances in a proportion of instances have led to lowered vitality and weakened resistance to disease. The reduction of the railway services, as also of trams and omnibuses, has led to overcrowding of all public conveyances when people are going to, or returning from, their work, thus affording very favourable opportunities for diffusing an infection like that of influenza, which is given off by the lungs and naso-pharyngeal secretions in the form of droplets expelled in the act of coughing or sneezing. Persons in the early stage of an attack and healthy carriers are able to infect their fellow travellers unknown to themselves or their victims. Hopeful evidence is accumulating that this infection only takes place at quite short range. A miniature epidemic in a surgical ward graphically recorded by Major MICHAEL G. FOSTER and Major H. A. COOKSON in another column suggests that trifling barriers may limit the spread of influenza. Professor VINCENT puts his attendants at the Val-de-Grâce in Paris in masks, covering eyes as well as nose and mouth, since in his view, although the range is short, lacrymal infection is a frequent occurrence. Theatres, music-halls, and especially picture palaces, often overcrowded and ill-ventilated, give great facilities for the spread of infection at closest range. These are the obvious contributing factors to the spread of the epidemic, and while they must be as well known to the public as to the medical profession, we cannot see on the part of the public any general attempt to limit intercourse where this is possible. To congregate and brood is too much the public attitude. In France, we learn from our Paris correspondent, the conditions are in the main the same as with us. The epidemic flared up with the onset of cold weather and the normal death-rate in Paris has been doubled. In Lyons all the schools and most of the theatres and cinemas are closed, while in Paris itself a wise caution has resulted in the postponement of a great sportive manifestation in which 10,000 young people were to take part. The Paris prefecture has obtained the compulsory notification of cases of influenza, which is not on the list as drawn up by the Academy; disinfection of rooms after fatal cases is also being carried out by the police authority. The department of military hygiene has organised a special service for influenza cases, which are being isolated in the military hospitals. Research is not being neglected and Dr. NICOLLE, director of the Pasteur Institute at Tunis, has announced to the Academy of Sciences his discovery of the pathogenic agent in the form of a filtrable virus, from which he hopes to prepare a serum.

Knowing all that we do, it is well to admit frankly that we are as yet in ignorance of the most important thing of all—namely, the actual conditions which cause the influenza virus from time

to time to take on increased virulence. It is possible that the exceptional conditions resulting from the war may have exercised some influence in this direction. The infection has this year been carried from one continent to another by shipping; most of the armies in the field have recently experienced the effects of epidemic influenza in more or less degree. In Europe, Spain seems to have been the country first attacked, hence the present term "Spanish influenza" for what was on a former occasion called "Russian influenza"; and subsequently Portugal, France, Holland, Germany, Austria, Hungary, Russia, Italy, Switzerland, Sweden, Norway, and Denmark were invaded. Influenza has been severely epidemic in South and West Africa; it has committed serious ravages in India, especially in Bombay; it has spread to Australia, South America, the West Indies, Canada, and the United States. The problem of how to limit the spread when it has gained a hold upon the country is a very difficult one, and the difficulty has been much increased by the shortage of medical men, which has placed the National Service Ministry in the awkward position of choosing between the needs of the fighting front, which are very urgent in view of the continued lamentable loss of doctors from wounds, and those of the home front, where many have been put out of action by influenza. Sir AUCKLAND GEDDES'S assurance is, therefore, doubly welcome that he has released for whole-time civilian practice in needy districts a very large number of medical men who were in official employment. For the rest we may trust the Local Government Board and the local health authorities to do their best in the circumstances, but the work of prevention is largely dependent upon the people themselves. If those who feel ill would stay at home; if those who are well would avoid travelling in railway carriages with the windows closed or in unventilated trams and 'buses; and, above all, if the public would forego picture palaces or other crowded places of amusement so long as the epidemic continues, much would be done to limit the spread in populous centres.

## Medical Practice in the Light of the Whitley Report.

THE Conference of Local Medical and Panel Committees held last week at the Connaught Rooms in London signalised the end of what may be called a party truce. Six months ago the Conference decided by an overwhelming majority not to embarrass the Government at a time of great national stress by pressing their just claim for an increased capitation allowance under the National Insurance Act. On Thursday of last week a vote on the same proposition was lost by a majority of less than two to one, many of the keen medical politicians present regarding the time as fitting for a great push. Gentler counsels, however, prevailed on the representation of the Insurance Acts Committee that no immediate action could be obtained without the proclamation of a general strike, for which an 80 per cent. vote of panel practitioners would be required. This would put a premature end to the conversations now taking place with the Commissioners in regard to compensation for increased cost of insurance practice arising from war conditions and other concessions short of alteration of the capitation fee itself. These conversations appear to be a realisation in matters medical of the trade council, which is the main theme of the Whitley Report; and although the Conference by its vote of confidence in the Insurance Acts Committee ratified this important principle of pourparlers at the source between employers and employed, feeling ran very high, just as in labour circles, against local approaches between panel (medical) and insurance (lay) committees, two London delegates alone supporting such local overtures. In certain towns, however, experience has already shown the beneficial effect of action of this kind, which is in harmony with the few successful adventures in industrial coöperation. Even the hot-heads agreed that an 80 per cent. strike among the rank and file of panel practitioners was unattainable in their own areas, with the possible exception of Lancashire.

Feeling at the Conference was unanimously against obtaining from the Insurance Commissioners differential distribution of pooled funds as between urban and rural practice, or different conditions of urban practice. Although the pressure of work without correspondingly increased pay has been keenly felt in some munitions areas, no one desired to introduce a possible source of dissension in the form of competition for a larger proportion of the central pool. The general principles for a more rapid and equitable distribution of the central pool formed the subject of an interim report which gained the assent of the Conference, and we print on p. 601 an outline of these principles, which will be considered in detail by Panel Committees throughout the country before their final acceptance. But it was admitted without question that existing conditions press with peculiar hardness upon rural practitioners. The mileage allowance at present granted does little more than cover the increased cost of petrol, if that; and in certain flagrant cases quoted the rural practitioner pays money for the privilege of making distant visits. A request for an increased allowance on account of mileage and for an addition on account of "timeage" was pressed upon the consideration of the Commissioners.

It is not unfair to conclude from the voting at the Conference that the financial conditions of Insurance practice are not very distasteful to a large majority of doctors on the panels. A further application of the principles of the Whitley report to panel practice might make these conditions positively agreeable, and this lesson is pointedly drawn in Professor H. R. KENWOOD'S presidential address to the Society of Medical Officers of Health, a portion of which we print on page 599. Professor KENWOOD foresees that the general practitioner will come to realise the need for working on preventive lines in connexion with disease of all kinds, and will in so doing take over much of the clinical work at present in the hands of the public health service. A health officer himself, he entirely disclaims the threatened encroachment by the official Public Health Service upon the domain of the general practitioner. To him this is a possible but an undesirable eventuality. The arbitrary and narrow distinction between preventive and curative medicine is breaking down, and the closer local organisation of administrative and clinical effort affords a pleasing alternative to a full-blown rate- and State-aided medical service. This can only come about by greater scope of work on the part of general practitioners upon councils of local sanitary authorities, activating these authorities by their presence to a fuller and sounder health policy. This is the true Whitley principle.

# Annotations.

"Ne quid nimis."

## DISPENSARY SUPERVISION OF TUBERCULOSIS IN THE HOME.

THE administrative control of tuberculosis is a problem deserving more than all the attention which is being given to it. Dispensary supervision is one of the simpler methods at present in use, and we would direct attention to Dr. George Jessel's article in the last issue of THE LANCET, in which he suggests that by suitable instruction, close supervision, and the occasional help of care committees some reasonable degree of sanatorium practice can be obtained from the systematic dispensary supervision of tuberculous patients in their own homes. His conclusion is that such home treatment is both "possible and safe" in dealing with 70 per cent. of the cases occurring in an industrial area of Lancashire. This proportion of the families concerned is able to provide a separate bedroom for the tuberculous member. It will readily be agreed that from home treatment under close supervision a considerable measure of success is obtainable with suitable patients in suitable homes in suitable districts. But it is always difficult to secure the proper regimen (including rest and exercise) and the necessary direction and supervision of details. The medical officer is dependent upon the intelligence and goodwill of the patient in carrying out instructions which cannot be enforced, and entirely suitable patients and conditions for home treatment may be regarded as exceptional among the poorer classes. We think that if the supervisory and stimulating visits of the medical officer and nurse or health visitor are not more frequent than those indicated by Dr. Jessel, the care of details will have a tendency to relax as the disease progresses, at a time when the need for such care is steadily increasing. A few months of previous training in a sanatorium and, when necessary and practicable, the provision of a shelter will certainly contribute materially to the number of instances in which home treatment becomes "possible and safe." It is to be hoped that Dr. Jessel will be able to develop his thesis further, and more particularly in the direction of a careful study and record of the course of the disease among his home-treated patients.

## THE CONTROL OF UNDESIRABLE IMMIGRANTS IN THE UNITED STATES OF AMERICA.

THE methods of preventing the introduction of epidemic disease at the Port of London were dealt with recently by the medical officer in a lecture at the Royal Institute of Public Health which we summarise on p. 612. Similar measures are in force in the United States of America. In 1912 quarantine authorities situated at the more important U.S. Atlantic ports examined 34,000 specimens of fæces from ship passengers and crews coming from cholera-infected ports. At the New York quarantine the cholera vibrio was isolated from 28 persons sick with the disease and from 27 healthy persons. Seven cases of cholera were detected at other ports by the same methods and the disease was kept out of the country. During the cholera epidemic in Germany of 1892–93 the American authorities instituted an inspection on foreign soil of everything to be imported to the United States. Officers of the United States Public Health Service stationed at foreign ports supervised the water- and food-supply of departing vessels, as well as inspecting crew and passengers. Those coming from infected localities were detained under observation for five days before being permitted to embark. In the Philippines, since American occupation, the inter-island spread of cholera, which in the past took toll of so many lives, is checked by a careful sanitary supervision of vessels at ports of departure and arrival. Extraordinary measures were taken a few years earlier to prevent the importation of bubonic plague. Under the direction of the U.S. Surgeon-General Pacific ports, notably San Francisco, were "cleaned up"; the community was freed of rats by a "drive" that necessitated the employment of scores of inspectors and which overlooked hardly a square foot of the city; the coöperation of the populace was secured by explaining the danger to them through meetings at schools, workshops, and offices and the daily press; quarantine precautions were increased. The plague was kept out. The public hygienic activities in the United States are not concentrated in the hands of one sanitary bureau. Some of the public health branches are a part of the U.S. Department of Agriculture, others are in the Department of Commerce, and the most important, the Public Health Service, is affiliated to the Treasury Department. One of its functions is the administration of the national maritime quarantine and the medical inspection of immigrants. It also makes special investigations of infectious diseases in States when necessary, although each several State has its own department of health. A large proportion of all persons engaged in public health work, both official and voluntary, are members of the American Public Health Association, which, while not an official organisation, contributes through its journal and regular meetings towards the general policy of dealing with contagious diseases.

## SCARLET FEVER IN JOHANNESBURG.

THE recent report of the acting medical officer of health of Johannesburg discusses the undue prevalence of scarlet fever in that city since October, 1917. The number of cases notified and the number admitted to the Fever Hospital during the last two years are as follows:—

| Period. | Total number of cases. | Number admitted to hospital. | Cost. |
|---|---|---|---|
| Year 1916-17 ... ... | 213 | 27 | £516 per annum. |
| ,, 1917-18 ... ... | 2083 | 440 | £8408 ,, |
| Month of July, 1918 | 255 | 47 | £759 for the month. |

The epidemic decreased somewhat between February and April of this year with a rise again in June. In July the cases fell to 255, and during the first 20 days of August only 126 cases were notified, showing a distinct tendency to decline of the epidemic. The problem of isolation became a perplexing one. The Johannesburg Nursing Home was opened at the beginning of July as an overflow for convalescent cases of scarlet fever, but soon after it was opened a cross-infection of scarlet fever and measles occurred both at the Fever Hospital and at the Nursing Home. So that fresh cases of scarlet fever could be admitted to neither. In consequence it again became impossible to isolate a considerable

number of cases of scarlet fever in which home isolation was entirely unsatisfactory. The Hospital Board thereupon decided to provide additional fever accommodation at the Otto Beit Convalescent Home. In addition to this general measures have been set in action, including the posting of circulars (in two languages) in public conveyances, the disinfection of tram cars, and the issue of special instructions to school authorities and to sanitary inspectors.

## TRAINING FOR INFANT WELFARE WORK IN INDIA.

EVERYONE will welcome with satisfaction the establishment of a school for the training of women health visitors and maternity supervisors by a voluntary association at Delhi, where the pupils will live under the supervision of the municipal health visitors. The conditions of entry are stringent. The candidate must be over 21 years of age, must have passed the sixth standard of general education or its equivalent, and must possess a certificate in midwifery approved by the council of the school. Preference will be given to candidates with a previous training in general nursing. Applicants, besides a good acquaintance with English, must know at least one Indian vernacular, and produce satisfactory evidence of physical and moral health. The course extends over six months, beginning on Nov. 1st, with the first month on probation. Pupils successful at the terminal qualifying examination will receive diplomas as trained health and maternity supervisors. The course will be made up of—

(*a*) Lectures on physiology, hygiene, and domestic sanitation, general and tropical sanitation, general medicine, tropical medicine, diseases of children, infant welfare, pre-maternity work.

(*b*) Practical demonstrations on general sanitation, domestic sanitation, and childbirth, first-aid and home nursing, with special reference to children's ailments.

(*c*) Lantern lectures and talks to mothers.

Pupils unable to pay their own expenses will receive a monthly stipend of Rs.40, enabling them to be trained, on the stipulation that they then serve the association for a period of three years. A monthly salary of Rs.100 and furnished quarters are guaranteed to them during this period. The salaries paid to maternity supervisors are on a rising scale, reaching at least Rs.250 a month. The initiative set by Delhi is one which might with advantage be followed by the innumerable other populous centres of India.

## THE SEROLOGICAL LOCALISATION OF ORGANIC BRAIN TUMOURS.

Dr. J. M. Retinger records in the *Archives of Internal Medicine* for August some interesting results gained in localising gross brain lesions by using a slightly modified form of the dialysis method of Abderhalden for testing the blood serum. Of the cases in which this method was used, 25 had been sufficiently studied clinically, or verified by operation or necropsy, to be considered. The clinical diagnosis or symptoms were not known to the writer, who performed the serological tests in most of the cases. On the basis of the findings in this limited series of cases, the serological diagnosis was supported in four instances by post-mortem results, in two by operation, and in 15 tests were found to be in complete agreement with definite clinical evidence. Two cases differed from the clinical diagnosis, but the latter had not been controlled by necropsy or operation, and in one case the necropsy proved the test to be erroneous. These results seem promising. The principles of this serological method of testing are familiar. It is found that pathological processes, or even physiological processes as in pregnancy, occurring in organs may release into the blood stream ferments found to possess a specific digestive faculty for such organs; this faculty can be tested by the power of such serum to digest "substrates" of the particular organ suspected, obtained and estimated under delicate laboratory conditions. In these tests the substrates used were obtained from human brains from necropsies of normal people. All the large vessels were removed, and in the cortex only the grey matter was used. The pieces were cut into small particles the size of a pea and thoroughly treated to remove all blood, fat, and lipoids. Each substrate was labelled according to the site from whence it was obtained. Against these various substrates the serum of the patient was tested, the presence of its digestive power, as determined by the ninhydrin colour test upon any particular substrate, indicating the probable involvement of the same area in the patient as that from which such substrate was obtained. A brief résumé of the cases examined is given. Case 10 is an interesting instance. Thirty-four different substrates were used. The motor area in the cortex showed pronounced positive reactions. The pituitary also gave strong reactions. The lesion lies in the anterior lobe of the pituitary. Diagnosis: acromegaly with occasional epileptiform attacks. Case 18 is also instructive. Forty substrates used. Lesion not in cortex. Most pronounced reaction with the cerebellar grey matter, dentate nucleus, anterior pituitary, and corpus callosum. The final diagnosis was a lesion of the cerebellum, confirmed on operation. Many of the other examples given are equally convincing, suggesting that, in some hands at any rate, the method may come to possess a more than academic value.

## PERFORATING ULCER OF THE HARD PALATE IN VINCENT'S DISEASE.

THE form of ulcerative tonsillitis associated with a spirochæte and a fusiform bacillus, known as "Vincent's angina,"[1] has recently attracted attention because of outbreaks at the front described as "trench mouth," "trench throat," and "trench gums" associated with the same organisms. It is also known that ulcerative lesions associated with these organisms may occur in other places—the bronchi, gastro-intestinal tract, and genitals. In the *Journal of the American Medical Association* Dr. L. F. Barker and Dr. R. Miller have reported a case of ulcer of the hard palate due to the same cause.

A man, aged 47 years, noticed one day on the roof of the mouth a small white spot, which developed in a few days into an ulcer that gradually became larger and more painful. Despite a negative history, syphilis was suggested by several practitioners. On examination there were marked oral sepsis and gingivitis, especially round the posterior molars, a fœtid odour of the breath, and a punched-out ulcer of the size of a dime on the hard palate, covered with thick, creamy, easily removed exudate, and surrounded by a deep red, somewhat indurated areola. The base of the ulcer bled easily. The clinical picture certainly suggested syphilis, a view concurred in by a throat specialist, but the Wassermann reaction was negative. Smears from the exudate showed enormous numbers of the *B. fusiformis* and many coarse, readily stained spirochætes, with from five to eight undulations. Vincent's angina was diagnosed and the lesion healed in a few days under dichloramine-T and local application of arsphenamine solution.

[1] THE LANCET, 1905, i., 1260.

The term "Vincent's angina" generally means a form of ulcerative tonsillitis due to the associated organisms mentioned and is the commonest form of this infection, but the term "angina" is obviously inapplicable to ulcers due to the same cause in other parts. Dr. Barker and Dr. Miller therefore suggest that the term "Vincent's disease" be applied to the whole group. Vincent's angina is liable to be confounded with syphilis and diphtheria. Hence the importance of bacteriological examination.

## PUBLIC HEALTH REFORM IN EGYPT.

A YEAR ago the High Commissioner of Egypt sanctioned the appointment of a Commission to study the reforms necessary for efficient public health administration. This Commission was formally approved by the Council of Ministers in June last and consisted of Lieutenant-Colonel Andrew Balfour, R.A.M.C., formerly Principal of the Gordon Research Laboratory at Khartoum, president; Lieutenant-Colonel G. E. F. Stammers, Mr. E. S. Crispin, Director of the Sudan Medical Department, and Dr. C. Todd, Director of Laboratories, Public Health Department. Its mandate was to examine the organisation and duties of an Egyptian Department of Public Health and its relations to other services; to submit proposals broadening the sphere of action of the existing Department, and to suggest the number and nature of the posts which will be necessary for the proper working of the Department without, however, nominating or making recommendations regarding them. After frequent meetings and a series of inspections into representative public health institutions, the Commission has drawn up a Report proposing reforms of a far-reaching character. The Report has not been published yet in this country but has now appeared in the *Egyptian Gazette*. Its more salient features will be commented upon here in an early issue, and we take this opportunity of recording our sense of the prescience shown by Sir Reginald Wingate, the High Commissoner, in appointing the Commission. For now is the right moment for setting in motion the outspoken recommendations of the Balfour Report.

THE diploma of honorary Fellowship of the Royal Society of Medicine will be presented to Sir Alfred Keogh at a special meeting of the Fellows on Wednesday, Nov. 13th, at 4.30 P.M.

THE Bradshaw Lecture of the Royal College of Surgeons of England will be delivered at the College on Thursday, Nov. 14th, at 5 P.M. Lieutenant-Colonel D'Arcy Power, the lecturer, has chosen as his subject Cancer of the Tongue.

FROM the Department of the Controller of Coal Mines we learn that a claim for additional fuel allowance on the ground of illness in childbirth will be allowed, the maximum quantity of fuel granted on such a claim being 5 tons.

AT the Royal College of Physicians of London Dr. F. H. Teale will deliver the Horace Dobell lecture dealing with Bacterial Toxins on Tuesday next, Nov. 5th. On the following Thursday, Nov. 7th, Colonel W. Aldren Turner, A.M.S., will give the Bradshaw lecture on the Neuroses and Psychoses of War. The Fitz-Patrick lectures follow on Nov. 12th and 14th, Dr. Arnold Chaplin having chosen for his subject Medicine in England during the Reign of George III. The hour in each case is 5 P.M.

## MEDICAL RECONSTRUCTION:

### THE SOCIETY OF MEDICAL OFFICERS OF HEALTH AND THE PUBLIC HEALTH SERVICE.

*The Ministry of Health Bill and the Relation of the General Practitioner to the Public Health Service*

AT the end of his Presidential Address upon the reconstruction of the Society of Medical Officers of Health, Professor H. R. KENWOOD made the following references to the Ministry of Health Bill and the relation of the general practitioner to the Public Health Service.

*The Ministry of Health.*

So many exaggerations of what a Ministry of Health can readily achieve have emanated from well-meaning enthusiasts with no first-hand acquaintance with health problems in their social setting that the Ministry must prove disappointing to many; but it will satisfy no one unless care is taken to start it upon the right lines. The difficult problem which lies before the Ministry of Health is well expressed in a letter by "Salus" in the *Times* of Sept. 26th, 1918. Therein it is pointed out that "successive Governments have never realised the mischief involved in our inveterate habit of piecemeal legislation, hand-to-mouth attempts to tackle by successive bites particular parts of what is essentially one problem and ought to be regarded and handled as one problem. ..... The problem of making proper provision for attaining and maintaining the maximum health of the people is broken up disastrously into many disconnected parts. All these different parts ought to be closely interconnected, planned, and worked in the closest relation to one another as coördinated parts of one system one whole."

The staffs of certain central Departments engaged in health work are to be transferred to the Ministry. This is, of course, necessary and desirable, but if they are merely to continue their operations under one roof (as it were) instead of several it is difficult to see where the value of this concentration will come in to compensate for all the disturbance it entails unless the Bill affords *a guarantee that the field of public health shall be viewed and dealt with as a whole* and not in separate "watertight" compartments, as hitherto. The fact is indisputable that central Government Departments have in the past done very little indeed to initiate public health reforms or to prepare public opinion for them. These Departments were never better medically advised than to-day, but it is too much to hope that Government action in public health matters will cease to follow, at an unnecessary distance, public opinion and local action. Indeed, the Departmental attitude of mind seems to be too groovy, too hesitating, and too compromising to originate advice and to initiate action. Take the Ministry of Health itself. The idea of this originated outside the Government or of any of its Departments: it owes its conception mainly to dissatisfaction of Government methods; the very impulse that is leading to its establishment is, again, external; and, furthermore, the impulse that will guide the Ministry to fresh conceptions and a bold initiative will also have to be external. It is because I realise that if this Bill is to be a real step on the road to an effective health policy that will not be unduly narrowed by the Departmental outlook, that I would urge the necessity of laying a sound foundation to the Ministry by doing what is possible to guard against this. It seems to me that the danger is great.

*Need of Surveying the Problem of National Health as a Whole.*

As an instance of compromise—and herein lies the main danger to which I would direct attention—the Bill, as publicly announced, provides for several consultative councils, each of which will doubtless play its own independent hand, and no linking-up advisory council is mentioned which shall be representative of the whole field of public health, and strengthened by a fair representation of non-official expert opinion, in order to bring a broader, fresher, and bolder outlook to bear upon the problems to be faced. Assuming that one of the proposed councils is to be a purely medical council, the real solution of public health problems involves manifold considerations; it is never entirely medical, although medical guidance must be predominant. I suppose that another council will deal with National Health Insurance. Well, the scheme of National

Health Insurance is capable of being made a very useful measure of public health, to which I question whether it has hitherto contributed to any material extent; but will this be as likely to take form at the hands of a special council, advising the Minister departmentally, as if it were represented on a general advisory council, leavened by those who are capable of stimulating the development, improvement, and adaptation of the scheme to the general and comprehensive public health needs?

At a meeting of members of the medical profession held at Steinway Hall on Oct. 1st Dr. Addison, Minister of Reconstruction, expressed the opinion that, as a first step, it was necessary to bring together the assortment of different Departmental responsibilities in health matters, and to secure that the thinking out and development of a systematic health policy, commensurate with urgent national needs, should be made the duty and responsibility of *a definite body of men*.[1] He stated that we should and must be the victims of sporadic, disjointed, and often conflicting effort until this was done. Is it likely, I would ask, that a Central Authority to coördinate all the public health work of several Central Departments, to take a comprehensive survey of public health needs, and to make far-reaching provisions for these, can be as competently advised in its general policy by several independent councils? Cannot the Ministry at its very inception do something to detach itself from the departmental outlook and tradition? Whatever councils may be provided to deal with different branches of work cognate to the public health, surely one body with the task of comprehensively surveying the problem of national health as a whole, and with the duty of advising a strong Minister of the necessary fresh efforts and reforms, is *indispensable to the Ministry in the shaping of its broad policy*. Everything will depend upon how the Ministry is advised, and I am sure that the well-wishers of the proposed Ministry will be left cold and disappointed if the Government fails fully to respond to the general demand for a newer and broader outlook and a better coördination in public health matters.

*Relation of the General Practitioner to the Public Health Service.*

We are ever rising to higher ideals of what "Public Health" should mean. We now recognise it to embrace all efforts towards the uplifting of the people to higher levels of health, happiness, and efficiency. This can only be attained by better and fuller measures of education, organisation, and administration.

I suppose that it is due to the somewhat narrow lines on which we train for our qualifying diplomas and degrees (whether of Public Health or Medicine) that most of us health officers start our public work with insufficient appreciation of the very important part which the general practitioners of medicine, surgery, and midwifery play in public health; how mutually dependent we are for results; and how much the public health needs a clearer linking-up and a better appreciation of our related services. We may rest assured that the near future is going to secure this by better provisions for the curative branch of public health and, perhaps, a wider administrative control of it.

Our official public health work is regarded by many as encroaching more and more upon the domain of the general practitioner. Even Sir Clifford Allbutt has recently gone so far as to suggest that general practice may become but a gleaning after the reapers. I do not conceive that the trend of the future developments is towards this undesirable eventuality. It seems to me to be more in the direction of improving the value and status of the general practitioner by calling for a development of the preventive side of his duties, and by securing (with the assistance of rate- and State-aided support) enhanced facilities for better and more prompt diagnosis and treatment; and, therefore, rather than the scope of the work of the general practitioner becoming more restricted, it seems to be destined for a real and important expansion.

Surely the most valuable part of public health work lies to the hand of the general practitioner; and it is to his interest to broaden his views to a fuller realisation of this, and to see that he is well prepared to play his part in the service of the public health. May I develop this point a little further? There is a general disposition to make an arbitrary and narrow distinction between preventive and curative medicine; but the sphere of prevention is common to both and embraces everything that contributes to health. The major part of all disease is not, in our present social circumstances, preventable. Even the M.O.H. has illnesses which could have been prevented, and he often prematurely dies from one of them. In this large field of, at present, unpreventable or unprevented disease the general practitioner operates. It is mainly by his efforts that it can be reduced to minimum dimensions and an enormous wastage from disablement and premature death be avoided; for the mortality from the diseases that a local health authority with the most comprehensive provisions takes under its administrative purview barely relates to one-third of the premature deaths from all causes in England and Wales. And we must not underestimate the great part which the general practitioner plays in the reduction of disease that *is* recognised as preventable, for the prompt diagnosis and treatment of *all* diseases are essentially preventive measures, and we are dependent on him for that early diagnosis and notification of communicable disease which starts our repressive machinery and determines its value.

*Suggestions in regard to the Improvement of National Health.*

The general practitioner, more fully trained and better equipped with local facilities for diagnosis and treatment, and stimulated by a fuller public recognition of the need for and value of his services in the prevention, the early detection, and the prompt cure of disease, becomes the very cornerstone of the public health edifice. In the reduction of preventable disease he works with a very fine-meshed sieve, in comparison with which ours is coarse indeed. A Ministry of Health that can view the entire health problem as a whole will inevitably bring the general practitioner into a more intimately organised relationship with the general health policy. But before the best results can be obtained the general practitioner must be better equipped by according to preventive medicine a more prominent place in his training; for this is essential to the sympathetic and purposeful organisation of the curative and preventive branches of medical work that is destined to become established. He will then better realise the necessity of working more on preventive lines in connexion with all disease; he will also undertake much of the clinical work which, largely by his default, is now in the hands of public health medical officials; his status and public value will thereby be enhanced, and he will more generally serve upon the councils of the local sanitary authorities and assist his official colleagues in activating these bodies to a full and sound health policy. The general practitioner has also to be trained in reference to the social setting of his work, for to be effective he must know intimately the social life of his patients at home and at work. No sufficient instruction is given in these matters at any medical school, and yet the prime aim and duty of medicine should be to secure and conserve the healthy body *in all circumstances*. To quote Sir George Newman: "His ignorance of his relationship to the community and his detachment from the social evolution proceeding around him has been a substantial contribution to his great hurt and undoing as a practitioner, and has not seldom shut him out from a large and liberal education in medicine." In default of this awakening I believe that the ultimate remedy will have to be a rate- and State-aided medical service for those who stand in need of it—for the present unsatisfactory medical care of the poor (generally speaking) is too profligate in its wastefulness to be tolerated much longer.

Surely the great public health needs at the present day are: (*a*) for a more determined effort to reduce the prevailing ignorance and carelessness among the poorer section of the community in matters connected with their health; and (*b*) for improved provisions for the medical care of the poor. The public must rise more to the demands of their health needs; short of this, there is no real remedy. Shall we ever live to see, even in this age of strikes, the industrial workers organising a strike against unsatisfactory health circumstances? Among the poorer section of the community the preventable loss of health, the utterly inadequate provision for promptly restoring the sick, and the premature mortality that results are a national reproach. The reproach is felt. Politicians allude to it and are ever voicing the policy of "Salus populi, suprema lex," but they afford little evidence of the necessary vision and determination to adopt the fuller measures necessary to give effect to this policy. Unless we

[1] THE LANCET, Oct. 5th, p. 466.

tinker with the problem the pecuniary cost entailed will be more than compensated by the increase in our national efficiency and productiveness.

The difficult and often demoralising sanitary circumstances of the poor must be made easier and more stimulating to hygienic observances, and hence a reasonable standard of decent housing should be everywhere demanded by the Government. But the best treatment of disease must be provided by fully competent general practitioners and specialists and by greatly increased institutional provisions, free of cost whenever a person's pecuniary means cannot secure these.

Gentlemen, our broader and ever-broadening concepts of public health are expanding the domain of our work and interests. There is going to be a closer organisation of administrative and clinical effort in State medicine, and those of us who are administrative officials are not going to show any lack of sympathetic appreciation and support to any suggestions for promoting the greater part which the practitioner of medicine is destined to perform in the fuller work of public health.

## INSURANCE PRACTICE.

### THE DISTRIBUTION OF THE CENTRAL POOL.

THE Insurance Acts Committee in connexion with the British Medical Association presented to the recent Conference of Local Medical and Panel Committees an interim report on the method of calculating the remuneration of doctors under the National Insurance (Health) Acts. The scheme, upon which we comment in a leading article this week, is set out in the following outline:—

1. The central pool for the year would be actuarially fixed before the beginning of the year on the basis of the sale of insurance stamps, allowance being made for the natural increase of population, and all other relevant data being taken into consideration.

2. The greater part of this pool (say perhaps 95 per cent.) would be assigned to the various insurance areas in such proportions as might be fixed by an appropriate Committee assisted by experts, on the basis of the number of names of insured persons on the register of the area in the previous year, or on an average for previous years, the fractional assignment so arrived at being either for one year or for a short period of years.

3. The reserved part of the central pool (say 5 per cent.) would be used to increase the amount assigned to any particular areas which, in the course of the year, showed to the satisfaction of the Committee that there had been therein an altogether abnormal net increase in the number of insured persons. Any residue of this reserved sum could be distributed at the end of the year in the proportions agreed upon for the main amount, or, if preferred, could be carried forward.

4. The present temporary resident calculations would be done away with, as affecting distribution of the central pool, the numbers of such residents treated in areas in which they had an appreciable effect being taken into consideration in fixing the fraction of the central pool to be assigned to the areas.

5. In the absence of any indication to the contrary, the present practice of distribution to areas on a uniform basis would be followed; but, if the profession indicated a strong preference therefor, it might be possible to arrange an assignment to areas on a differential basis, differences in the incidence of sickness and in the conditions of practice in rural, colliery, industrial, urban, and residential urban areas being taken into account, but it is doubtful whether there are at present available data which would enable this to be done.

6. The area pool (with the exception of the small residue) being thus fixed at the beginning of the year, the distribution to individual practitioners would be made definitely quarter by quarter.

7. The basis of such distribution to practitioners within the area would be left, within wide limits, to local option, but would be in accordance with principles, methods, or conditions to be discussed in a further report on this part of the subject.

NATIONAL HOSPITAL FOR THE PARALYSED AND EPILEPTIC.—In consequence of the prevalence of influenza the celebration of Founders' Day at the National Hospital for the Paralysed and Epileptic, Queen-square, W.C., arranged for Nov. 4th, has been postponed

## THE BELGIAN DOCTORS' AND PHARMACISTS' RELIEF FUND.

THE following letter (enclosing a draft for £20) has been received by the hon. treasurer to the Fund:

2, Beach-street, Clovelly, Sydney, Australia,
Sept. 6th, 1918.

Hon. Treas., Belgian Doctors' Relief Fund.

DEAR SIR,—I am enclosing a cheque for £20 (or rather draft) as a small subscription to the above Fund.

I have returned after three years of war, and know something of what these brave Belgian people must be living through.

Yours sincerely,
ROY WINN, M.B., Ch.M.

### SUBSCRIPTIONS TO THE SECOND APPEAL.

The following subscriptions have been received up to Monday last, Oct. 28th:—

| | £ | s. | d. |
|---|---|---|---|
| Dr. Alfred Cox (monthly) | 1 | 1 | 0 |
| Sir A. Pearce Gould (monthly) ... ... ... | 5 | 0 | 0 |
| Dr. Cameron Kidd (for Mrs. Stuart Todd) ... | 1 | 0 | 0 |
| Dr. F. M. Neild ... ... | 5 | 0 | 0 |
| North of England Branch B.M.A. (per Dr. J. Don, Hon. Sec.)— | | | |
| Dr. H. A. Brand... ... | 5 | 5 | 0 |
| Dr. S. V. Tinsley... ... | 1 | 1 | 0 |
| Dr. J. W. Smith... ... | 5 | 5 | 0 |
| Dr. A. Smith, jun. ... | 5 | 5 | 0 |
| Dr. C. J. Henderson... | 1 | 1 | 0 |
| Dr. Harris-Liston ... | 1 | 1 | 0 |
| Dr. Connon ... ... ... | 0 | 10 | 0 |
| Dr. L. Walker ... ... | 1 | 1 | 0 |
| Dr. G. A. Atkinson ... | 5 | 5 | 0 |
| Dr. H. H. Aitchison... | 5 | 5 | 0 |
| Dr. M. A. Wardle ... | 1 | 1 | 0 |
| Dr. E. F. Pratt ... ... | 5 | 5 | 0 |
| Dr. R. A. Morris... ... | 1 | 1 | 0 |
| Dr. H. R. Kendal ... | 1 | 1 | 0 |
| Dr. J. G. D. Cort ... | 1 | 0 | 0 |
| Archdeacon Henderson | 1 | 1 | 0 |
| Dr. R. Forsyth ... ... | 3 | 3 | 0 |
| Dr. W. Mussellwhite... | 2 | 0 | 0 |
| Prof. David Drummond | 10 | 10 | 0 |
| Dr. H. Kershaw ... ... | 2 | 2 | 0 |
| Dr. W. W. Stainthorpe | 2 | 2 | 0 |
| Dr. W. Petter ... ... | 1 | 1 | 0 |
| Dr. C. G. Maclagan ... | 3 | 3 | 0 |
| Dr. J. Hedley ... ... | 3 | 3 | 0 |
| Dr. H. A. Fielden ... | 5 | 0 | 0 |
| Dr. N. F. Rowstron ... | 1 | 1 | 0 |
| American Red Cross Commission for Belgium (monthly) ... | 200 | 0 | 0 |
| Dr. J. C. M. Given ... | 1 | 1 | 0 |
| Hon. Med. Staff of Bolton Infirmary (per Dr. Mothersole) ... ... | 25 | 0 | 0 |
| Dr. Charlotte E. Warner | 1 | 0 | 0 |
| Dr. Roy Winn (Australia) | 20 | 0 | 0 |
| Dr. T. M. Tibbetts... ... | 1 | 1 | 0 |
| Dr. C. H. Brangwin (China) ... ... ... ... | 5 | 0 | 0 |

Subscriptions to the Fund should be sent to the treasurer of the Fund, Dr. H. A. Des Vœux, at 14, Buckingham Gate, London, S.W. 1, and should be made payable to the Belgian Doctors' and Pharmacists' Relief Fund, crossed Lloyds Bank, Limited.

## URBAN VITAL STATISTICS.

(Week ended Oct. 26th, 1918.)

*English and Welsh Towns.*—In the 96 English and Welsh towns, with an aggregate civil population estimated at 16,500,000 persons, the annual rate of mortality, which had increased from 11·4 to 20·7 in the four preceding weeks, further rose to 30·9 per 1000. In London, with a population slightly exceeding 4,000,000 persons, the death-rate was 34·5, or 14·4 per 1000 above that recorded in the previous week; among the remaining towns the rates ranged from 7·0 in Grimsby, 9·0 in Dewsbury, and 9·9 in Sunderland, to 63·1 in Hull, 67·4 in Bootle, 71·4 in Leicester, 72·1 in Birkenhead, and 74·6 in Oxford. The principal epidemic diseases caused 219 deaths, which corresponded to an annual rate of 0·7 per 1000, and included 81 from diphtheria, 66 from infantile diarrhœa, 25 from measles, 22 from whooping-cough, 19 from scarlet fever, and 6 from enteric fever. The deaths from influenza numbered 4488, against 1895 in the previous week, and included 1256 in London, 233 in Sheffield, 230 in Liverpool, 197 in Leicester, 175 in Portsmouth, 148 in Hull, and 127 in Cardiff. The 1251 cases of scarlet fever and 1200 of diphtheria under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital were 10 above and 5 below the respective numbers remaining at the end of the previous week. The causes of 79 deaths in the 96 towns were uncertified, of which 12 were registered in Liverpool, 11 in Birmingham, and 9 in Portsmouth.

*Scotch Towns.*—In the 16 largest Scotch towns, with an aggregate population estimated at 2,500,000 persons, the annual rate of mortality, which had increased from 10·6 to 28·3 in the six preceding weeks, further rose to 29·4 per 1000. Of the 1358 deaths from all causes, 57 were classified to influenza, which was also stated as a contributory cause in 457 deaths classified to other diseases; in the previous week these numbers were 63 and 426 respectively. The 732 deaths in Glasgow corresponded to an annual rate of 34·3 per 1000, and included 13 from whooping-cough, 5 from infantile diarrhœa, 2 from enteric fever, and 1 from diphtheria. The 125 deaths in Edinburgh were equal to a rate of 19·6 per 1000, and included a fatal case each of scarlet fever and diphtheria.

*Irish Towns.*—The 362 deaths in Dublin corresponded to an annual rate of 47·3, or 8·7 per 1000 above that recorded in the previous week, and included 162 from influenza, 3 from infantile diarrhœa, 2 from enteric fever, and 1 each from whooping-cough and diphtheria. The 104 deaths in Belfast were equal to a rate of 13·8 per 1000, and included 4 from infantile diarrhœa and 1 from whooping-cough.

WEST LONDON MEDICO-CHIRURGICAL SOCIETY.—A clinical meeting will be held to-day, Friday, Nov. 1st, in the society's rooms, West London Hospital. The chair will be taken at 8.30 P.M.

# Correspondence.

"Audi alteram partem."

## THE STORY OF A "NEW" DISEASE.

*To the Editor of* THE LANCET.

SIR,—In your interesting editorial article on epidemic catarrh in THE LANCET of Oct. 26th you refer to Dr. F. G. Crookshank's recent Chadwick lectures on "The Story of a New Disease," implying that he really regarded the disease as a new one. I was present at the first lecture and presided at the second, and I can say that his contention—ably supported by arguments and historical references to epidemics of an influenzal type extending as far back as the thirteenth century—was that outbreaks of mental and physical manifestations such as are now grouped under the comparatively new name of "Heine-Medin disease," and of which infantile paralysis is only one of the most striking, had been constantly found attendant upon or had closely followed in obvious connexion with such epidemics. Perhaps Dr. Crookshank would have better entitled his lectures as the story of a "new" disease.

In addition to your valuable prophylactic suggestions with regard to the present epidemic, may I say that if persons entering densely crowded underground lifts and cars were to keep their mouths closed—by preference upon an antiseptic lozenge—and breathe only through the naturally protective nasal passages, and if, further, some simple method of frequently sterilising all public telephones were adopted, the incidence and spread of influenza would be much abated.

I am, Sir, yours faithfully,

London, Oct. 28th, 1918. R. DOUGLAS POWELL.

## A NEW TYPE OF INFLUENZA.

*To the Editor of* THE LANCET.

SIR,—Dr. Wm. Collier's very interesting letter in your issue of Oct. 26th on the clinical aspects of the influenza now raging in so many parts of the world is an important contribution to the literature of the prevailing pandemic. In the main, my clinical experience of the cases observed in the Meath Hospital and County Dublin Infirmary and in my private practice within the past three weeks agrees closely with Dr. Collier's observations. I must state, however, that tachycardia has been more frequently observed in the early stages of an attack associated with extremely high temperatures than bradycardia. The latter condition is of frequent occurrence in the convalescent stage. To-day I counted 42 heart beats per minute in a convalescent patient. Epistaxis has been of frequent occurrence in the severe cases. And I have come to measure the gravity of a given attack by the intensity of the albuminuria which is present. Of this untoward condition Dr. Collier makes no mention. It is apparently of toxæmic origin. Its presence is quickly attended by extraordinary manifestations of delirium and of the ataxic state generally.

It has fallen to my lot to witness a cholera epidemic in 1866, small-pox epidemics in 1872 and 1878–80, and last, not least, the epidemic (or rather pandemic) of influenza in 1889–90, of which Dr. Collier speaks. But, in my opinion, none of those visitations equalled the present outbreak in extent, virulence, or treacherous course. In fatal cases widespread mischief has been found in connexion with the breathing organs. An advancing disseminated or island pneumonia is more frequent than a fibrinous lobar pneumonia. Extensive bronchial catarrh in one direction and pleuritis in the other direction are associated with varying degrees of pneumonitis or of pulmonary sanguineous œdema. But the development of the ataxic state—insomnia, raving, tremor, and dry black tongue, with sordes on the teeth and lips—sufficiently indicates the profoundness of the system-poisoning of this really terrible disease in many instances. The bacteriological findings include Pfeiffer's *Bacillus influenzæ*, the *Diplococcus pneumoniæ* of Fränkel, and a streptococcus, the two latter as secondary infections.

I am, Sir, yours faithfully,

Dublin, Oct. 28th, 1918. JOHN W. MOORE, M.D., F.R.C.P.Irel.

## INFLUENZA AND PREVENTIVE INOCULATION

*To the Editor of* THE LANCET.

SIR,—I venture to criticise the note on administration of vaccine for influenza, published by the War Office, in THE LANCET of Oct. 26th. I find myself wholly at variance with the suggestions of the Committee as regards the dosage of the influenzal moiety of the vaccine proposed, and the following remarks are entirely confined to that portion of the vaccine, as I regard the pneumococcal and streptococcal doses as admirable. The list of gentlemen on the Committee is one of gifted and able bacteriologists of such eminence that to differ from them is a serious matter. But the question of influenza vaccine dosage, in the absence of requisite experimental work thereon, is not a question of pure science so much as a question of practice. This being so, one immediately recognises the scarcity of practitioners on the Committee. It seems to follow, therefore, that the Committee had to depend to a very great extent on the experience of at least a minority of its members in this matter, and to this extent its opinion loses weight. However that may be, I venture to say that the doses proposed, 30 and 60 millions, are inadequate to a degree seriously imperilling the value of the vaccine.

I have been in the habit since July, 1916, of investigating my cases of catarrh with the aid of blood and trypsin-blood plates planted from sputum, nasal swabs, or post-nasal swabs. Particularly have I used the latter in non-catarrhal periods between recurrent attacks of catarrh, and very frequently have I in these conditions demonstrated influenzal infections, and repeatedly have I recovered influenza bacilli from the trypsin plate when the parallel blood plate failed me utterly in this respect. Thus my experience of these infections is extensive. Moreover, all my cases are treated with vaccines prepared on my medium.[1]

As the result, therefore, of more than two years' experience of the medium I am firmly convinced that appropriate and successful therapeutic doses are, except in the case of perhaps the first two or three doses, very frequently larger than the Committee's proposed prophylactic doses. The great difference of opinion between us as to dosage may be accounted for by a possible change of toxicity in vaccine grown on my medium. As the required quantity of vaccine can only be prepared by using my medium, and as this method is in fact being used, the possibility of this change of toxicity becomes important, and it also makes my two years' experience of vaccine prepared by this method more valuable. Another point that bears on this question of dosage is the fact that for some years the mixed cold vaccine issued by St. Mary's and distributed by Parke, Davis, and Co. contains per c.cm. 300 millions of influenza bacilli, grown on my medium. Few, if any, complaints as to general reactions are heard, and yet the doses advised are 0·5 c.cm. and 1 c.cm.

It is, of course, obvious that with the methods of culture available before my method was introduced the quantity of influenza bacilli in a given vaccine was a question of much moment, and it is almost inconceivable that under the old conditions vaccine, even in the attenuated form suggested, could have been provided in a reasonable time for large bodies of troops. This aspect of the matter is entirely changed by my method. Indeed, the issue of the mixed vaccine will certainly not be delayed because of an insufficiency of influenza vaccine. This I can say as I am personally supplying quantities of the vaccine to the military authorities through the Inoculation Department, St. Mary's Hospital.—I am, Sir, yours faithfully,

JOHN MATTHEWS,
Bacteriologist, St. Mary's Hospital.

Wimpole-street, W., Oct. 28th, 1918.

*To the Editor of* THE LANCET.

SIR,—The extremely interesting account of the proceedings of the Committee appointed by the War Office on the question of the utility of vaccines in the prevention of influenza provisionally suggests that influenza is caused by an unknown microbe, and that the microbes so far discovered in the disease are complicatory and not causal. This is quite a tenable theory and may be true, and the point must still remain *sub judice*. Having watched all the epidemics of

[1] THE LANCET, July 27th, 1918.

influenza since that of 1889–90, I think the following observations are of importance.

For the last 10 years I have examined personally, and not being a skilled bacteriologist, under the supervision of Dr. Matthews, a large proportion of the sputa of patients suffering clinically from influenza. 1. In the majority of cases the bacillus of Pfeiffer has been discovered. 2. In all of the epidemics some other germ has been found present with it. 3. The associated germ has varied in different epidemics. 4. In some *Bacillus influenzæ* has not been found, and the attacks seem to have been due to streptococcus or pneumococcus, and occasionally to other microbes, such as *Bacillus septus*, &c. 5. In long-continued or frequently recurrent cases I have seen rapid cures and prevention of recurrence as the result of a course of vaccine treatment, the vaccine being made from the germ or germs discovered in the sputum.

I therefore venture to suggest that influenza is the name given to a well-recognised fever syndrome, and that it can be the result of any of these germs when they become epidemic. Why a germ is at one time epidemic, at another sporadic, we do not know, but we recognise this feature in other diseases, and also that some epidemics are severe in type, others mild. Influenza never disappears, cases crop up all through the year, and every year sees an epidemic. "Feverish cold" is probably a mild influenza; for the same germs are found in the two diseases.

It therefore seems probable that preventive inoculation will be beneficial, although too much must not be expected, as one attack of influenza does not (like small-pox, for instance) protect for long against a second. It seems to give a temporary immunity and future attacks tend to become milder. I am, Sir, yours faithfully,

H. A. DES VŒUX, M.D. Brux.

Buckingham-gate, S.W., Oct. 26th, 1918.

*To the Editor of* THE LANCET.

SIR,—In the summary of the decisions come to at a War Office Conference reported in your issue of Oct. 26th there is one important recommendation which cannot be too strongly emphasised—viz., that the mixed vaccine issued by the R.A.M. College should not be employed as a means of treatment in acute cases. May I suggest, however, that the same objection does not apply to the use of sensitised vaccines? These can be given and in much larger doses without the same risks, and trial might well be made of these in view of the comparative failure of the usual remedies employed in the treatment of the secondary infections which appear to be the chief factor responsible for a fatal issue. Such sensitised vaccines could be prepared at every laboratory centre throughout the country from strains isolated from cases occurring within the range of each centre. While expectoration appears to be absent in many of these cases, there is always a sufficient number available from whom cultures may be obtained, and as fresh cases occur new strains can be accumulated fairly quickly.

The specimens of sputum which I have had the opportunity to examine here, where the epidemic is still of recent origin, appear to contain pneumococci, streptococci, or both, as the predominating organisms. The sputum from one fatal case, for instance, yielded practically a pure growth of a *Streptococcus longus*. In the absence of expectoration, and where time is a factor of vital importance, a mixed sensitised vaccine containing streptococci and pneumococci might be prepared from strains isolated from such cases as are available. This would constitute the nucleus of a stock vaccine to which, when obtained, suitable additions should be made. If such vaccines are to be employed it is scarcely necessary to add that they should be given early, and not when the patient is *in extremis*.—I am, Sir, yours faithfully,

ROBERT DONALDSON, M.D., F.R.C.S. Edin.

Reading, Oct. 28th, 1918.

Dr. R. W. ALLEN informs us in a letter received too late for publication that he has had good results in a series of 50 cases of influenza from the use of intravenous injections of oil of garlic. After determining on himself that 3 mins. of *Oleum allii sativi* could be given with impunity, he administered the oil to patients suffering from influenza in a 10 per cent. solution, using equal parts of alcohol and pure ether as the solvent. The initial dose was 5–10 mins., repeated twice or thrice daily. In patients thus treated cough was relieved, sputum came away more freely, and temperature fell rapidly. In no instance did pneumonia supervene. The only drawback noted was an overpowering smell of garlic in the breath.

## NASO-PHARYNGEAL INFECTION AT THE ONSET OF CEREBRO-SPINAL FEVER.

*To the Editor of* THE LANCET.

SIR,—The chief point at issue in the present controversy is the question of the constancy of the meningococcus in the naso-pharynx of the patient at the onset of cerebro-spinal fever. Staff Surgeon P. Fildes's letter in your issue of Oct. 26th does not help us at all, since he fails to specify to which of the contradictory views previously expressed by him he now inclines. Had his experience of outbreaks of cerebro-spinal fever extended beyond the perihelion of Haslar, perhaps Staff Surgeon Fildes would have realised that carriers of the meningococcus are of two kinds, namely, temporary or chronic, and that during an epidemic the former have been found considerably to outnumber the latter, to whom alone he seeks to confine the term carrier. If he will study particulars of the carefully investigated outbreak at a large military depôt described by Captain J. A. Glover in the *Journal of the Royal Army Medical Corps* of January, 1918, he should have his horizon enlarged upon the subject of carriers. At the height of the outbreak in question the carrier rate among non-contacts in the depôt was found to be over 70 per cent!

In spite of the views of Staff Surgeon Fildes and Major J. Dorgan I still maintain that the constant presence of the meningococcus in the naso-pharynx of the patient at the onset of cerebro-spinal fever indicates that every case may be regarded as an instance of a carrier developing the disease. Once the meningococcus is lodged in the upper respiratory passages, the question as to whether the host becomes a case, a temporary or a chronic carrier, would appear to depend upon the degree of his specific susceptibility or resistance to the particular type of meningococcus operating. Moreover, while the vast majority of carriers escape the disease, even chronic carriers occasionally develop it, as Colonel W. M. Flack has shown.

I am, Sir, yours faithfully,

M. H. GORDON,
Lieutenant-Colonel, R.A.M.C.

Central S.S.F. Laboratory, London, S.W. 1, Oct. 28th, 1918.

*** The opposing views have now been stated and in several directions repeated. It is clear that further bacteriological study of the conditions is required.—ED. L.

## TREATMENT OF CONCUSSION APHASIA BY GENERAL ANÆSTHESIA.

*To the Editor of* THE LANCET.

SIR,—In 1915 I read an article on this subject in THE LANCET (Oct. 30th, p. 977) by Major A. P. Procter, C.A.M.C., who gave three cases of concussion aphasia treated by general anæsthesia with good results. He related a case of a soldier who, while in the trenches, was buried in a dug-out by an explosive shell, and when taken out he became unconscious. After a few days in the hospital he regained his consciousness, but was unable to speak. One day he was allowed to visit the village with some of his companions and while there became intoxicated; in this condition he found his voice and regained his power of speech. The other two cases were treated by ether and during the stage of excitement they were induced to speak.

On account of this useful article I have tried eight patients in Chulalongkorn Red Cross Hospital with successful results.

CASE 1.—Nai M., aged 20, had severe convulsions from tetanus for three days, and when recovered was unable to speak. He was admitted to Chulalongkorn Hospital and was then anæsthetised by ether just enough to induce excitement. At this moment he was asked a few simple questions, such as his name, address, age. At first he tried to utter two or three words with difficulty. Next day he was anæsthetised again; but this time he could speak a few words clearly, and after the third trial he regained power of speech completely. During the intervals of the anæsthesia the patient was roused to speak by asking him a lot of questions.

CASE 2.—Nai A., a cadet, aged 18, during the manœuvres "saw a ghost" and fell down unconscious. He was admitted, anæsthetised twice, and regained speech.

CASE 3.—Nai A., a private, aged 19, was put on scout duty, and was brought in unconscious without any apparent cause. For many days he was drowsy and unable to speak. He was anæsthetised, and could speak on the second trial.

CASE 4.—Nai C., a Chinaman, aged 30, got high fever some months ago and had lost power of speech during the height of the fever. He was anæsthetised and could speak on the first trial.

CASE 5.—Nang Y., a Cantonese, aged 26, came for the treatment once and never came again; perhaps she could speak afterwards and held herself as cured.

CASE 6.—A child, aged 5, got fright while the electric light was out; she saw many dreadful objects during the darkness. She was admitted and anæsthetised and her speech recovered.

CASE 7.—Nang N., aged 27, got high fever and could not speak. When she came to the hospital she had lost her speech for four months; she was then anæsthetised and recovered on the first trial.

CASE 8.—A child, aged 1½, lost speech after a high fever. When the temperature came down to normal for two days she was anæsthetised with chloroform in an operation for unerupted tooth. On the next day she began to cry all day and then regained her speech completely within three days.

These eight cases prove that temporary aphasia due to shock or high fever can be cured by general anæsthesia.

I must thank Captain Phien Sinhajai for his assistance in giving the anæsthetic in these cases.

I am, Sir, yours faithfully,

HLUANG SAKDA BHOLARAKSHA (NAI CHEUNE),
M.R.C.S., L.R.C.P.,
Lieutenant-Colonel; Director, Chulalongkorn
August, 1918. Red Cross Hospital.

## INFLUENZA AND NASAL DRILL.

*To the Editor of* THE LANCET.

SIR,—I should like to draw your attention to the fact that the Hancock system of nasal hygiene described by me for the prevention and treatment of adenoids in your issue of August 24th is also proving a most successful preventive of influenza.

I think it is clear that the "induced sneeze" with its accompanying flow of lymph, followed by "handkerchief drill," is more likely to rid the nose of infection than any nasal douche. The advice so frequently given to "sniff up antiseptic lotions" may, indeed, prove harmful, as the germ-laden dust particles and smuts which nature endeavours to stop at the anterior nares may be carried up to the more vulnerable and sensitive part of the nasal mucosa.

Many of the parents of the children attending the Westminster Health Association clinic, where this system is practised, speak most enthusiastically of the way their children have escaped, although in some cases directly exposed to infection. I am, Sir, yours faithfully,

Hanover-square, Oct. 27th, 1918. ISABEL ORMISTON.

## THE BROADENING OF THE PUBLIC HEALTH SERVICE.

*To the Editor of* THE LANCET.

SIR,—Might I be allowed to express the pleasure which will be caused to many by Lieutenant-Colonel Kenwood's Presidential Address on the Reconstruction of the Society of Medical Officers of Health, and especially by the part in which he advocates the formation of sections of the society representing the several branches of activity of public health officers, administrative school hygiene, tuberculosis, child welfare, and venereal disease? This suggestion was singled out by Sir Arthur Newsholme, who gave it his hearty approval, saying that all these officers were medical officers of health. In view of the probability of the formation of a National Medical Service the doings of the Society of Medical Officers of Health, as representing the oldest and most definite civilian medical service, have an added importance. Those of us who are serving in His Majesty's forces will look forward after the war to a state of affairs in which the many useful features of the naval and military medical services are preserved, and especially the perpetuation of the arrangement whereby a medical man automatically receives the advantage of his increased experience by promotion, no matter the branch of medical work in which he has been engaged. Such an arrangement cannot be said to exist in the Public Health Service as at present constituted.

I am, Sir, yours faithfully,

Oct. 21st, 1918. JUSTITIA.

REGULATION 40 D.—A meeting of protest against Reg. 40 D, D.O.R.A., will be held at the Queen's Hall, Langham-place, on Wednesday next, Nov. 6th, at 7.30. The following resolution will be submitted:—

"This meeting demands the immediate withdrawal of Regulation 40 D under the Defence of the Realm Act."

The chair will be taken by Mrs. Henry Fawcett, and free tickets of entry can be obtained from the Secretary of the Association for Moral and Social Hygiene, 19, Tothill-street, S.W. 1. Seats can also be reserved by small payments.

# THE SERVICES.

### ROYAL NAVAL MEDICAL SERVICE.

Surgeon Commander (ret.) to be Surgeon Captain (ret.): C. G. Matthews.

Surgeon Lieutenants (temp.): W. A. W. Parkes and H. S. Le Marquand to Haslar Hospital.

### ARMY MEDICAL SERVICE.

Major-Gen. Sir Walter G. A. Bedford and Col. B. J. Inniss are placed on retired pay.

Temp. Col. Sir F. Treves, Bt. (Hon. Col., R.A.M.C., T.F.), relinquishes his temporary commission on re-posting.

Temp. Col. H. H. Tooth (Lieut.-Col., R.A.M.C., T.F.) relinquishes his temporary commission on re-posting, and is granted the honorary rank of Colonel.

Capt. (temp. Major) D. W. C. Jones, R.A.M.C., T.F., to be temporary Colonel whilst specially employed.

### ROYAL ARMY MEDICAL CORPS.

Lieut.-Col. F. McLennan to be acting Colonel whilst employed as Assistant Director of Medical Services of a Division.

Major D. G. Marshall (Indian Medical Service, ret.) to be temporary Lieutenant-Colonel whilst specially employed.

Major H. F. Shea to be acting Lieutenant-Colonel whilst specially employed.

Temp. Capt. (acting Major) J. O'D. Egan to be acting Lieutenant-Colonel whilst specially employed.

Capt. D. Pottinger relinquishes acting rank of Major on re-posting.

To be acting Majors: Capts. H. L. Howell, H. C. Todd, F. C. Cowtan, T. J. Hallinan, T. F. P. Breen, Lieut. (temp. Capt.) R. L. Ritchie, Temp. Capts. C. C. Court, W. E. Hallinan, T. T. Higgins, J. M. Renton, R. O. H. Jones, C. R. Wills, H. C. W. Allott, D. F. O'Kelly, Temp. Lieut. A. T. Mackenzie.

Temporary Captains to be acting Majors whilst specially employed: D. K. Henderson, H. D. Robb.

Late temporary Captains granted the honorary rank of Captain: W. Clow, M. B. Arnold.

Temporary Lieutenants to be temporary Captains: W. T. McCutcheon, A. Brown, J. A. O'Regan, G. R. Halloran.

Officers relinquishing their commissions: Temp. Capts. J. Morlet, J. F. C. O'Donohoe, H. L. H. Greer, J. M. Kelly, G. A. Lyons, G. Munro, O. Barton, A. R. O. Milton, L. F. Lovell-Keays (on account of ill-health, and is granted the honorary rank of Captain), H. C. Burbidge (on account of ill-health, and is granted the honorary rank of Captain), W. C. W. Glenny (on account of ill-health), Temp. Lieut. N. Beattie, Lieut. R. B. Fletcher (on account of ill-health contracted on active service, and is granted the honorary rank of Lieutenant). Temp. Hon. Lieut. C. F. Larson.

*Canadian Army Medical Corps.*

Temp. Capts. (acting Majors) to be temporary Majors: O. S. Waugh, W. G. Lyall, W. L. Mann.

Temp. Capt. F. J. Tees to be acting Major while employed as Surgeon.

SPECIAL RESERVE OF OFFICERS.

Capt. (acting Major) J. G. McCutcheon to be acting Lieutenant-Colonel whilst in command of a Medical Unit.

Capt. S. J. A. H. Walshe to be acting Major.

To be Lieutenants: Second Lieut. F. Holmes (from Unattached List, T.F.), G. P. N. Richardson, W. G. Burns (from Glasgow University Contingent, O.T.C.).

TERRITORIAL FORCE.

Lieut.-Col. (Hon. Col.) H. H. Tooth is restored to the establishment on relinquishing his temporary commission in the Army Medical Service.

Major C. H. Usher is restored to the establishment.

Major (Brevet Lieut.-Col.) F. E. A. Webb, from General List, to be Lieutenant-Colonel on the permanent personnel.

Capt. (acting Lieut.-Col.) (General List) G. E. G. Mackay reverts to acting Major on ceasing to command a Field Ambulance.

Capt. P. J. Sheedy relinquishes his commission on account of ill-health, and is granted the honorary rank of Captain.

Capt. G. Wright is seconded for service with a General Hospital.

Capt. (acting Major) G. B. Gill relinquishes his acting rank on ceasing to be specially employed.

Capts. G. B. Gill, J. L. M. Symns, J. A. Morris, J. L. E. McHugh, D. G. Kennard, and T. B. McKee to be acting Majors whilst specially employed.

Capt. A. Ramsbottom to be acting Lieutenant-Colonel whilst commanding a Field Ambulance.

Capts. (acting Lieut.-Cols.) H. B. Pope and H. A. Macmillan relinquish their acting rank of Lieutenant-Colonel on ceasing to command a Field Ambulance, and revert to the acting rank of Major.

Capts. (acting Majors) D. W. Reese and A. B. P. Smith relinquish their acting rank on ceasing to be specially employed.

Capt. (acting Major) A. G. Hebblethwaite, D.S.O., relinquishes his acting rank on vacating appointment as Deputy Assistant Director of Medical Services.

Capt. R. W. MacKenna to be acting Major whilst specially employed, and remain seconded.

Lieuts. R. S. Moon and A. C. Swanston-Thomas to be Captains.

W. W. Earwaker and A. S. Reeves to be Lieutenants.

### ROYAL AIR FORCE.

*Medical Branch.*—H. T. H. Butt and H. Greenwood (late Captain, R.A.M.C.) are granted temporary commissions as Captains.

D. Cromie, H. Hilliard, and W. Inman are granted temporary commissions as Lieutenants.

*Dental Branch.*—B. G. Kechnie is granted a temporary commission as Lieutenant.

### INDIAN MEDICAL SERVICE.

The services of Major R. F. Steel have been placed at the disposal of the Government of Bombay, and the services of the following temporarily at the disposal of the Government of India: Lieut.-Col. E. F. G. Tucker and Major W. H. Dickinson; Lieut.-Col. J. G. Hojel (for employment on military duty).

# The War.

## THE CASUALTY LIST.

THE following medical officers appear among the casualties announced since our last issue :—

*Killed.*

Major J. Morris, M.C., R.A.M.C., was educated at Edinburgh University, and qualified in 1904. He held appointments at the Dinorwic Quarries Hospital and at the Denbighshire Infirmary, and was a member of the R.A.M.C. (T.F.) prior to the war. At the time of going on active service he was in practice at Hyde, Cheshire, where he was also police surgeon and medical referee for several assurance companies. The award of the M.C. was recorded in THE LANCET of Jan. 6th, 1917, p. 38.

Capt. P. J. O'Reilly, M.C., R.A.M.C., attached East Yorks Regiment, qualified in Ireland in 1914, and prior to joining the R.A.M.C. was in practice in Dublin. The award of the M.C. was recorded in THE LANCET of Nov. 18th, 1916, p. 881.

Capt. J. G. MacNeill, Canadian A.M.C.

*Died.*

Major C. W. C. Myles, M.C., R.A.M.C., qualified in Dublin in 1912, and was in practice at Merthyr Vale, Glamorganshire, prior to joining the R.A.M.C. The award of the M.C. was recorded in THE LANCET of Jan. 12th, 1918, p. 79.

Capt. F. O. Spensley, R.A.M.C., was a student at St. Thomas's Hospital, London, and qualified in 1907. He held an appointment at the Lowestoft Hospital, and prior to joining up was senior assistant medical officer at the Darenth Industrial Colony, Dartford, Kent. He died from pneumonia at the Burdon Military Hospital, Weymouth.

Major R. H. McGillycuddy, M.C., R.A.M.C., was a student at University College Hospital, London, and qualified in 1911. Prior to joining the R.A.M.C. he was in practice in West London. The award of the M.C. was recorded in THE LANCET of Jan. 22nd, 1916, p. 215.

Major (acting Lieut.-Col.) T. C. Rutherfoord, I.M.S., was a student at St. Thomas's Hospital, London, and qualified in 1902. At the time of his death, from malaria, he was in command of a field ambulance.

Surgeon-Commander T. Austen, R.N., was a student at Charing Cross Hospital, London, and qualified in 1888. In 1894, when attached to the *Curacoa*, he had charge of wounded rebels after they had been shelled from their trenches near Apia; and in 1904, when attached to the *Talbot*, he rendered first-aid to the disabled Russian cruiser *Variag* after her engagement with a Japanese squadron at Chemulpo, Corea. He died at the R.N. Hospital, Chatham.

Major H. W. Carson, D.S.O., R.A.M.C., qualified in Ireland in 1905, and joined the R.A.M.C. soon afterwards. The award of the D.S.O. was recorded in THE LANCET of June 8th, 1918, p. 822.

Capt. J. H. Connolly, R.A.M.C., qualified at Edinburgh in 1902 and held appointments at the Throat Hospital, Golden-square, London, at the Chesterfield and North Derbyshire Hospital, and at the Royal Albert Hospital, Devonport. He joined up soon after the outbreak of war, at which time he was in practice at Putney and was surgeon in charge of the throat, nose, and ear department of the Queen's Hospital for Children and chief assistant in the aural department at St. Bartholomew's Hospital, London. He died at the Acheson Military Hospital, Regent's Park, London.

Major J. H. McNicol, M.C., R.A.M.C., was a student at Glasgow University, and qualified in 1909. He was at one time assistant to the professors of pathology and of medicine at Glasgow Royal Infirmary, and prior to joining the R.A.M.C. was in practice at Dennistoun, Glasgow. The award of the M.C. was recorded in THE LANCET of July 10th, 1915, p. 99.

Lieut.-Col. L. P. Demetriadi, R.A.M.C.(T.), was educated at Leeds University, and qualified in 1886. He was in practice at Edgerton, Huddersfield, where he was examiner for the St. John Ambulance Association and medical referee for several assurance companies. He was twice mentioned in despatches, and had command of the West Riding Casualty Clearing Station. He died after a long illness contracted whilst on active service.

Capt. R. D. D. D. Brownson, R.A.M.C., was educated at Cambridge University and at the London Hospital, and qualified in 1908. He held appointments at the Great Ormond-street Hospital, London, and at the London Hospital, and died at Peshawur, India, from influenza.

*Lost at Sea.*

Dr. T. R. Beale-Browne, West African Medical Service, was a student at Guy's Hospital, London, and qualified in 1901. He was at one time assistant medical officer at the Northampton County Asylum, and later joined the West African Medical Staff. He was lost in the s.s. *Baruta*, sunk in collision early in October.

*Previously reported Missing, believed Drowned, now reported Drowned.*

Capt. W. J. Enright, Canadian A.M.C., qualified at Laval University in 1897. Prior to joining the Canadian Contingent he was in practice at Port Daniel Centre, Quebec.

*Wounded.*

Capt. R. McC. Hill, D.S.O., R.A.M.C., attached Argyll and Sutherland Highlanders.
Capt. G. Davidson, R.A.M.C., attached R. Fusiliers.
Major D. McKelvey, M.C., R.A.M.C.
Capt. W. E. Elliot, M.C., R.A.M.C., attd. Dragoon Guards.
Capt. J. M. Elliott, R.A.M.C.
Capt. H. L. Garson, M.C., R.A.M.C.
Major W. W. Wells, R.A.M.C.
Major J. F. Burgess, Canadian A.M.C.
Lieut.-Col. D. P. Kappele, D.S.O., Canadian A.M.C.
Capt. D. G. Gardiner, R.A.M.C., attached Devon Regt.
Capt. E. W. D. Hardy, M.C., R.A.M.C., attd. Lancers.
Capt. J. D. Stewart, Canadian A.M.C.
Capt. H. S. Evans, R.A.M.C.
Capt. H. A. C. Swertz, R.A.M.C., attached Royal Scottish Fusiliers.
Capt. R. Lindsay, R.A.M.C., attached Grenadier Guards.
Capt. J. C. Ogilvie, M.C., R.A.M.C., attd. Border Regiment.
Capt. R. E. Pitts, R.A.M.C., attached Duke of Wellington's Regiment.

## CASUALTIES AMONG THE SONS OF MEDICAL MEN.

The following additional casualties among the sons of medical men are reported :—

Second Lieut. N. Gardner, West Riding Regiment, attached Lancashire Fusiliers, killed in action, youngest and last surviving son of the late Dr. J. Gardner, of Kelvinside, Glasgow.

Capt. M. J. N. McCreery, Royal Dublin Fusiliers, died of pneumonia, son of the late Lieut.-Col. N. McCreery, R.A.M.C.

Capt. (acting Major) R. C. Lundie, D.S.O., R.E., killed in action, only son of Dr. R. A. Lundie, of Edinburgh.

Lieut. F. T. Maurice, Grenadier Guards, died of pneumonia, elder surviving son of Brevet Col. W. J. Maurice, R.A.M.C., of Reading, Berks.

Capt. H. G. Powers, M.C., killed in action, only son of Dr. C. H. Powers, late of Westend, Hants.

Midshipman J. D. A. Lane, R.N.R., lost at sea, only son of Capt. H. A. Lane, R.A.M.C., of Chelsea, London, S.W.

Major C. W. C. Myles, M.C., R.A.M.C., died of pneumonia, younger son of the late Dr. J. P. Myles, of Birr, Ireland.

## AUXILIARY ROYAL ARMY MEDICAL CORPS FUNDS.

The annual general meeting was held at 11, Chandos-street, London, W., on Oct. 25th. Sir Alfred H. Keogh was re-elected President; Lieutenant-General T. H. J. C. Goodwin, D.G.A.M.S., was elected Vice-President; and Major W. F. Brook, Colonel Sir Thomas Crisp English, Colonel J. E. Gemmell, and Lieutenant-Colonel F. S. Irvine were elected to the committee. The report of the recommendation of the Committee for Grants up to Sept. 30th, 1918, was adopted. The list of grants to orphans of officers under the Benevolent Branch totalled just under £400 in 11 separate grants.

At a committee meeting held previously grants were made to orphans of seven officers amounting to £240, and to the widows and orphans of six members of the rank-and-file amounting to £234. These Funds are for the education of the children of officers of the Auxiliary Royal Army Medical Corps who have lost their lives during the present war, or have been severely disabled by it; also for widows and children of similar members of the rank-and-file.

Requests for help, as well as subscriptions, should be addressed to the honorary secretary, 11, Chandos-street, Cavendish-square, London, W. 1.

INDIAN SCIENCE CONGRESS.—The sixth annual meeting of the Indian Science Congress will be held in Bombay from Jan. 13th to 18th, 1919. The Governor of Bombay will be patron of the meeting and Lieutenant-Colonel Sir Leonard Rogers, I.M.S., will be president. The sectional president, medical research, will be Lieutenant-Colonel Glen Liston, I.M.S.

# OBITUARY OF THE WAR.

## MICHAEL JOSEPH O'FLYNN, M.D.R.U.I.,

LIEUTENANT, ROYAL ARMY MEDICAL CORPS.

Lieutenant M. J. O'Flynn, who died of wounds in France on Sept. 24th at the age of 39 years, was son of James O'Flynn, of Six Mile Bridge, co. Clare. He was educated at Black Rock, Dublin, and at the National University of Ireland, taking the degrees of M.B., B.Ch. in 1903, and the M.D. four years later. After gaining experience in resident hospital appointments, making a special study of eye work, he settled down in practice at Neath, Glamorgan, in 1909, and the following year married Florence, second daughter of J. H. Davey, J.P., of Briton Ferry. At the outbreak of war he acted as the local military civil doctor for the district, and in November, 1917, joined the R.A.M.C., when he was attached to various units in France, finally to the 1st Northamptonshire Regiment. He met his death while attending the wounded on the battlefield.

Dr. O'Flynn is described by his friends as one who loved his work and whose genial disposition and untiring devotion to duty made him beloved by a wide circle. He leaves a widow and four children. Two of his sisters are practising medicine.

## WILLIAM LESLIE DANDRIDGE, B.A. CAMB., M.R.C.S. ENG.,

LIEUTENANT, ROYAL ARMY MEDICAL CORPS.

Lieutenant W. L. Dandridge, who died of wounds on Oct. 5th, was youngest son of Alfred Dandridge, of Beckenham, Kent. He was educated at Sherborne School, going on in 1912 to Emmanuel College, Cambridge, where he graduated in Arts. In 1916 he went to the Isonzo front with a Red Cross ambulance, returning to England after a few months to complete his medical curriculum. After obtaining the diplomas of the Conjoint Board, he joined the 103rd Field Ambulance in France, and it was while accompanying a party of stretcher-bearers to the front line on Oct. 3rd that he was wounded, surviving his injuries only for a few days. Enthusiastic in his work, and of a bright and cheery disposition, Lieutenant Dandridge will be missed by a large circle of friends. His eldest brother was killed at the Battle of the Somme in August, 1916.

Captain ANDREW ROSS, C.A.M.C., who was killed in action on Sept. 29th at the age of 42 years, was a native of Huron, Ontario, and graduated in medicine at the University of Toronto in 1904. He came overseas in April, 1916, as a private in the C.A.M.C. and went to France in June, 1916, with the 8th Canadian Field Ambulance. In July of last year he obtained a commission and was posted to No. 2 Canadian General Hospital and re-posted to a field ambulance in September, 1918.

## FREDK. HOYSTED BRADLEY, M.B., CH.B. EDIN.,

DISTINGUISHED SERVICE ORDER;
LIEUTENANT-COLONEL, ROYAL ARMY MEDICAL CORPS.

Lieutenant-Colonel F. H. Bradley, who was killed in action on Sept. 22nd, at the age of 34, was youngest son of the late Canon Bradley, of Monaghan, Ireland. He was educated at Campbell College, Belfast, where he held a scholarship, and at Edinburgh University, where he graduated M.B., Ch.B. in 1906. After graduating he filled the posts of house physician and resident medical officer at the Stanley Hospital, Liverpool, and entered the R.A.M.C. in 1908, seeing service in various stations at home before he was sent to India in 1910. He went to France in the second month of the war and served there continuously until his death. Latterly he was in command of the 15th Field Ambulance, and was awarded the D.S.O. in January of the present year. A friend and colleague writes of Colonel Bradley: "I had known him ever since he came as O.C. to the ambulance, and he has always shown the greatest kindness and consideration for all his officers. When there was any difficulty he was always ready to come to one's help, and in times of danger he was always ready to take his part."

Colonel Bradley married in 1912 Esther Ellen Lacey, daughter of the late William Hargreaves, of Liverpool, who predeceased him.

## WILLIAM BOYD JACK, M.D. GLASG.,

CAPTAIN, ROYAL ARMY MEDICAL CORPS.

Captain W. B. Jack, who died of wounds on Oct. 11th, was a student at Glasgow University, graduating M.B., Ch.B. in 1905 and taking his doctorate three years later. He held successive house appointments at Glasgow Royal Infirmary before joining Dr. W. B. Cockill in private practice at Kendal in 1907. He was an able and conscientious practitioner, who quickly gained the esteem of all and the gratitude of many. His fellow-practitioners felt that they had in him a steadfast and loyal comrade, and his never-failing kindness and courtesy endeared him to a wide circle of patients and friends. In 1911 he joined the staff of the Westmorland County Hospital, where his sound judgment and professional knowledge were of the greatest value to the patients and help to his fellows. He obtained a commission in the R.A.M.C. in March of last year and was attached to a Leicestershire regiment. In May last he was gassed, and it was while advancing with his regiment in the fight for St. Quentin that he received the wounds which he himself quickly recognised as mortal. The deepest sympathy goes to his wife and three young children.

Captain HERBERT ANTHONY CULHAM, C.A.M.C., who was killed on Oct. 4th, aged 35 years, was a native of Hamilton, Ontario, and graduated in medicine at the University of Toronto in 1910. He came overseas in October, 1916, serving with units in England until November last, when he went to France with No. 2 Canadian Field Ambulance. At the time of his death he was attached to a brigade of Canadian Field Artillery

# Obituary.

## ROBERT BRUDENELL CARTER, F.R.C.S.,

CONSULTING OPHTHALMIC SURGEON TO ST. GEORGE'S HOSPITAL; FORMERLY PRESIDENT OF THE MEDICAL SOCIETY OF LONDON.

ONLY a few weeks ago we announced Mr. Brudenell Carter's ninetieth birthday, and on Wednesday evening in last week his long life came to an end. It is 50 years since he first joined the staff of THE LANCET, and in those early years of his connexion with us his forcible editorial contributions made a weekly appearance in our columns. Then for some years, especially during the last 20 years of the past century, his public work made it inconvenient for him to assist us, but in 1899, having by that time ceased to be a member of the General Medical Council, he resumed his close editorial connexion with us. As age grew on him his contributions became less frequent, but, nevertheless, his clear and vigorous leading articles were always acceptable to our readers; on his eightieth birthday he wrote a leading article on the same subject for the *Times* and THE LANCET in which identical general views were expressed, but in which he exactly hit off in the arguments employed and the methods of employing them the due variations in the audiences he was addressing. As late as 1915 in a private letter to the present editor of THE LANCET, who had mentioned that the war had depleted his staff, Carter observed: "You speak of being short-handed; if this refers to writers I might possibly do something to help, and I need not say that you could command my services although I should not like to attempt writing under much pressure as to time." He was then 87 years of age. Carter's death is truly for us a break with the past.

Robert Brudenell Carter, the son of an officer in the Royal Marines, was born at Little Wittenham, Abingdon, in 1828, and entered the medical school of the London Hospital at the age of 19, after having served the course of apprenticeship to a general practioner which in those days was the orthodox method of entering the medical profession. He became M.R.C.S. in 1851 and L.S.A. in the following year, when he went into general practice in the north of London. But in the spring of 1854, when England and France declared war against Russia, Carter, like many other young surgeons, went to serve in the Turkish Army in a voluntary capacity, and while there he contributed both to the *Times* and THE LANCET letters and papers of his Crimean experience. The letters to the *Times* had a great future influence on his career. On his return to England he again went into general practice in suburban London, and then left for Nottingham, where he remained for some years, and where he was first attracted to ophthalmology in particular, while writing also on general medical subjects. Later he moved to Chatham, and in 1868, being then 40 years of age, he came up to London, deciding to tempt fortune as an ophthalmic surgeon, being now in possession of the F.R.C.S. This bold step he has described in a further letter to the editor of THE LANCET in the following words:—

> "My life generally is calculated to encourage hopefulness under adverse circumstances. Up to the age of 40 I was a conspicuously unsuccessful general practitioner in the country. In my forty-first year I decided to burn my very small and shallow boats and to come to London. Within a year I was a leader writer for the *Times*, a constant contributor to the editorial columns of THE LANCET, and surgeon to the Royal South London Ophthalmic Hospital. Within two years I was ophthalmic surgeon to St. George's and my way was fairly clear.
>
> I think it is a point in my favour that, as I could not afford the six years' hospital practice as a student necessary for the Fellowship of the Royal College of Surgeons, I determined from the first to maintain my knowledge of anatomy and to keep fully abreast of surgery. The result was that as soon as I had completed the necessary 12 years as a Member, I was able to go up from my country practice for the Fellowship examination without either rest for study or coaching, and to pass. But for this, of course, I could not have obtained hospital posts.
>
> Pray excuse my troubling you with this yarn about myself, and please excuse the bad writing. I am in a reclining chair and write on a pad held in my left hand."

From 1870 until 1893 Carter was ophthalmic surgeon to St. George's Hospital, and during all that time he conducted a large ophthalmic practice and communicated to the professional world some admirable work on eyesight generally. His lectures on Cataract, on Eyesight in Schools, on Optical Appliances, and on the General Cause of Good and Bad Eyesight were all valuable expositions on questions that required to be treated in a plain manner by a well-informed writer.

In 1881–82 he was Hunterian professor of surgery and pathology in the Royal College of Surgeons of England, and shortly afterwards was elected President of the Medical Society of London, having in 1884 been Lettsomian lecturer. A Knight of Justice and Honorary Commander of the Order of St. John of Jerusalem, he was consulting surgeon to the ophthalmic hospital at Jerusalem; while his knowledge of French, which equalled his knowledge of German, was placed at the disposal of the cause of sanitation generally when he became Foreign Secretary to the French Society of Hygiene. In 1893 he was, after 23 years' service, elected consulting ophthalmic surgeon to St. George's Hospital and also to the Royal South London Ophthalmic Hospital.

In 1875 appeared his "Practical Treatise on Diseases of the Eye," which was at once recognised as a valuable addition to ophthalmic literature. An extremely skilful man of letters, he got over the difficulty supremely well which a specialist has in writing a text-book. Such a medical author may propose to write for the benefit of the general profession, discovering for them the principal points of his own branch of practice, or he may write as a specialist for specialists, submitting his own views and practice to expert criticism. Carter managed to do both things. He gave a general view of the present state of knowledge with regard to the nature and treatment of the more important diseases of the eye, but from individual experience he was able to add original suggestions and to subject the work and views of other well-known specialists to just and lively criticism. His whole object was to see general practitioners skilful in detecting and treating eye disease, and he placed in their hands a manual of great value to that end. Several editions of his book were issued, edited by himself and later by Mr. W. Adams Frost, while he also wrote the articles on Diseases of the Eye in "Quain's Dictionary of Medicine," and the section of ophthalmic surgery in "Holmes's System of Surgery." He also translated Zander's original work on the ophthalmoscope and Scheffler's "Optical Defects of the Eye." Carter's contributions to medical and special scientific literature were, it will be seen, numerous, and they always possessed the particular virtues of clearness and force. Eloquent, incisive, more than occasionally bitter, he was also a generous writer, and few members of the medical profession have wielded greater power with the pen, while he possessed the equally valuable gift of being able to speak in public with the same command of language and high level of literary style. Carter's "leaders" belong to an older day—he used the Latin "period" and orotund full-dress methods—but any appearance of pomposity thus given to his writings was purely superficial; no writer of to-day is more fastidious than was Carter in his choice of language or more resolutely averse from the use of stale metaphors, trite tags, and obvious morals.

Clear speaking and close debating made him during his 20 years on the General Medical Council a force in the proceedings of that body, and strongly conservative member although he always was, it should be placed on record that he was the author of that change in the methods of the Council by which it was rendered possible to deal in a suitable measure with comparatively trivial professional offences. Carter devised the expedient of postponing decision upon small offences until the next session, the interval being thus rendered a period of probation. When he joined the Council there were many cases in which there was no choice but to inflict the penalty of erasure from the Register for quite trivial offences or else to condone them altogether. Even if they came within definitions of "infamous conduct," which the Council had already laid down, cases of "covering an unregistered practitioner," for example, differed immensely as to degree of turpidity. More than once men who had but just entered the profession were expelled from it for what was little more than foolish good nature and which only needed an admonition, and this was the cruelty that Carter set out to right. Since he succeeded in introducing the change there has been scarcely a session in which it has not been brought into useful operation.

Carter was of ancient family, being eleventh in descent from Thomas Carter, a gentleman bearing arms who was settled at Higham, Bedfordshire, in the reign of Edward IV. He married first Helen Ann Beauchamp, daughter of John Becher: and secondly Rachael Elizabeth, daughter of Stephen Hallpike and widow of the late Walter Brown. By his first wife he had four sons.

This is but a brief chronicle of a long and busy career, but Carter's life in far greater detail is chronicled in "Doctors and their Work," a volume which he wrote some 15 years ago.

# Parliamentary Intelligence.

## NOTES ON CURRENT TOPICS.

*The Housing Bill.*

A SECOND reading was given to the Housing Bill in the House of Commons on Monday, Oct. 28th, but a certain amount of criticism arose on the fact that its scope was limited. Mr. HAYES FISHER, the President of the Local Government Board, however, explained in moving the second reading that the Bill was only an instalment of the Government programme which he had unfolded to the House in May during the discussion on the estimates of his department. That programme would again be brought before the House in a much larger measure dealing with the whole of the financial aspects of the problem and incorporating many other means by which the action of the State could be linked up with that of local authorities, public utility societies, and also, he hoped, private enterprise. The right honourable gentleman could not say when that measure would be introduced. The first clause in the present Bill gave financial encouragement to county councils to build houses for their own employees. The second clause gave powers whereby where the smaller local authorities had not taken adequate steps to provide houses for the population of their areas the Local Government Board should have the right to call in the county council to carry out the duty. Several honourable Members emphasised the connexion of housing and health, and expressed regret that the Government had not brought forward a larger measure now.

*The Midwives Bill.*

The Midwives Bill was read a second time in the House of Lords on Tuesday, Oct. 29th. As the Bill now stands, Clause 12 repeals Section 9 of the Midwives Act, 1902, which enabled county councils to delegate their powers over midwives to district councils. Where such delegation has already occurred, it shall not be affected unless the county council concerned, with the consent of the Local Government Board, withdraws the delegation.

## HOUSE OF COMMONS.

WEDNESDAY, OCT. 23RD.

*Cooking in Military Hospitals.*

Answering Mr. GILBERT, who asked whether there were many complaints as to the way in which food was cooked in London Military Hospitals, Mr. MACPHERSON (Under Secretary for War) wrote: Some complaints of the nature mentioned have been received, and an officer from the War Office has been sent to investigate the matter and make suggestions with a view to improvement. I would add that the whole question of cooking in military hospitals is receiving close attention, and the appointment of expert lady cooks to act as inspectors of cooking in military hospitals is at present under consideration.

*Prevention of Anthrax.*

Mr. JOWETT asked the Home Secretary what action he had taken to secure the disinfection of dangerous wool since he received the report of the Departmental Committee which reported, on Nov. 23rd, 1917, that at a very small net cost infected wool could be rendered free from danger from anthrax.—Sir G. CAVE replied: The honourable Member refers presumably to the preliminary report of the Disinfection Subcommittee of the Departmental Committee which was received and presented to Parliament last spring. The report deals only with the results of the investigation into methods of disinfection; it contained no proposals for applying its conclusions, and in the covering letter submitting the report the Committee expressly advised that no action should be taken pending their final recommendations. The final report, which is being issued to-day, was only received last month. It makes a series of far-reaching proposals, involving the erection of disinfection stations abroad as well as in this country, the establishment of a special authority, and international coöperation. These proposals will be considered and the necessary action taken without delay.

THURSDAY, OCT. 24TH.

*Venereal Disease and Regulation 40 D.*

Mr. LEES-SMITH asked the Home Secretary whether any provision was to be made by which women who were arrested under the Defence of the Realm Act, Regulation 40 D, and against whom no conviction was obtained, were to receive compensation for undergoing the special medical examination for venereal disease.—Sir G. CAVE answered: The reply is in the negative.

Mr. LEES-SMITH: Has the right honourable gentleman taken into account the statement made last week that of the prosecutions made under this regulation, almost one-half of the women are found to be not guilty, but although not guilty they are subjected to this examination, which is a terrible penalty in itself; and will he either give them compensation or withdraw the regulation?—Sir G. CAVE: No, Sir, when the examination is made it is made by consent.

Mr. LEES-SMITH: Is the right honourable gentleman aware, with regard to his statement that this examination is made by consent, that the prosecutor for the Government stated that if the women refused to undergo the examination it would be taken as proof against them?—Sir G. CAVE: I am not aware of that. It would not be a proper statement to make.

Mr. LEES-SMITH asked whether the right honourable gentleman would now issue instructions that the consent of women to undergo the special medical examination for venereal disease provided for in the Defence of the Realm Act, Regulation 40 D, should in all cases be obtained in writing.—Sir G. CAVE replied: The question is under the consideration of the committee recently appointed.

*Medical Men and the Pensions Ministry in Ireland.*

Mr. NUGENT asked the Parliamentary Secretary to the Ministry of Pensions whether he had refused applications for employment under Government by medical officers who had previously served in any capacity under the National Insurance Commissioners in Ireland, irrespective of previous long or active service; and, if so, whether he would explain why this course had been adopted, in view of the promise given by the Prime Minister.—Sir A. GRIFFITH-BOSCAWEN said in reply: I am not aware of any ground for this suggestion. The selection of medical men to act as referees in Ireland was entrusted by the Minister of Pensions to a committee specially appointed for the purpose, consisting of representatives of the Irish Local Government Board, Irish Insurance Commission, Ministry of Pensions, Ministry of National Service, Irish Medical War Committee, President of the Royal College of Surgeons, and Irish Medical Committee. The report received from the committee shows that very great care was exercised in the duty entrusted to them and that the medical men selected were unanimously agreed to.

*Medical Women in Military Hospitals.*

Sir P. MAGNUS asked the Under Secretary for War whether, having regard to the fact that medical women serving in military hospitals discharged similar duties and received the same pay as men doctors and were entitled to wear the Royal Army Medical Corps badge, he would take steps to rectify the anomaly of their being refused even honorary commissions or to wear badges of rank which would be helpful to them in maintaining discipline; and whether he could arrange that they should obtain equivalent relief from income-tax as was granted to men doctors under the service rate.—Mr. MACPHERSON replied: I am reconsidering this question. Perhaps my honourable friend will be good enough to ask me a question on the subject next week. The last part of the question is one for the Treasury.

*Effect of Occupations on Women's Health.*

Mr. ROWNTREE asked the Minister of Reconstruction whether, in preparation for the task of demobilisation, any careful inquiry had yet been made into the effect of different occupations on the health and physique of women; and, if so, could the result of such inquiry be made public.—Dr. ADDISON wrote in reply: In addition to the reports of the Health of Munition Workers Committee, which has recently been published, the Home Office has undertaken an inquiry into the question referred to. The inquiry is now completed and the question of publication is a matter for the Home Secretary.

*Rabies and the Pasteur Treatment.*

Mr. R. MCNEILL asked the President of the Local Government Board whether, in view of the danger arising from the existence of rabies in the country, he would issue information to the public as to what facilities there were for obtaining Pasteur treatment, and as to the steps that should be taken by individuals who might be bitten by suspected dogs.—Mr. HAYES FISHER replied: A circular on the procedure to be adopted was sent to medical officers of health in Devonshire and Cornwall as soon as the Local Government Board was informed of the presence of rabies among dogs in these counties. It has now been revised, and a copy of the revised circular will be sent to the press.

*Maternity Benefit.*

Sir C. KINLOCH COOKE asked the President of the Local Government Board whether he was aware that cases had arisen where women, insured under the National Insurance Act, had taken advantage of the workhouse for their confinement and subsequently drawn the maternity benefit; and would he consider the advisability of making some provision so that in cases of this kind guardians might be in a position to apply for and receive some portion of this benefit.—Mr. HAYES FISHER answered: The reply to the first part of the question is in the affirmative. In view of the provisions of Section 111

of the National Insurance Act, 1911, and Section 20 of the National Insurance Act, 1918, I could not take the action suggested in the latter part of the question.

*Sanatorium Treatment.*

Replying to Mr. BOWERMAN, Sir E. CORNWALL (representing the National Insurance Commissioners) wrote: Some 30,000 insured persons annually have, since the National Insurance Act, 1911, came into operation, received residential treatment for tuberculosis in sanatoria and hospitals in addition to the large numbers which have received dispensary and domiciliary treatment. But this still leaves a regrettable number of cases for which accommodation is lacking. The war has made serious difficulties in regard to building operations and other matters involved in providing more institutional accommodation.

MONDAY, OCT. 28TH.

*The Influenza Epidemic.*

Mr. DENMAN asked the President of the Local Government Board whetner he could make any statement as to the prevalence of an epidemic of influenza; whether it was causing a rise in the rate of mortality; whether it was associated with other diseases; and what steps were being taken by his department and should be taken by the public to combat it.—Mr. HAYES FISHER replied: The present epidemic of influenza is causing a considerable rise in the rate of mortality, as will be seen from the weekly returns of the Registrar-General, but happily the rise is not so great as that experienced in Vienna and Paris, and, I believe, in other such large towns. Numerous conferences have taken place between representatives of my department, of the naval and military authorities, and the Board of Trade in regard to the transport of troops. The medical officers of my department have also been in consultation with the Army Medical Department and the Medical Research Committee, and bacteriological investigations have been continuously made since the commencement of the summer outbreak. These show that bacteriologically this outbreak does not differ from other outbreaks of influenza, the fatality being due to secondary infections chiefly by pneumococci and streptococci. I have also called a special conference of the representatives of all the departments concerned. As to the steps which can be taken by the public, I may refer to the memorandum of my medical officer which has been issued. This memorandum emphasises the fact that control over this catarrhal disease is only practicable by the active coöperation of each member of the community, and medical officers of health have brought the precautions recommended by the memorandum to the notice of the local public by means of special leaflets and in other ways.

Mr. DENMAN: Are we to anticipate a Ministry of Health in the near future?—Mr. HAYES FISHER: I do not think that arises.

Colonel C. LOWTHER: Is it a fact that there are two distinct epidemics—influenza and septic pneumonia?—Mr. HAYES FISHER: I do not think that we can say that there are two.

Mr. PONSONBY: Is the spread of this disease largely due to malnutrition?—Mr. HAYES FISHER: I have no reason to think that that is the case.

Mr. PRINGLE: Will the right honourable gentleman make representations to the National Service Department to refrain from calling up further medical men, and to the War Office to release more medical men from the Army for civilian service?—Mr. HAYES FISHER: I am sure the Minister of National Service must have taken notice of the fact that medical men are seriously wanted in every department of civil life.

*Administration of Medical Benefit.*

Mr. CURRIE asked the representative of the National Insurance Commissioners whether his attention had been drawn to the difficulty arising out of the issue of his Departmental Circular 242 X, dated June, 1918, which would result in numbers of insured persons losing medical benefit by reason of their earnings now exceeding £160 a year; whether he would, by legislation or otherwise, take steps to prevent this result, in view of the fact that £160 was now of less value than £100 when the 1911 Act was passed; and whether meantime he would suspend or modify the said circular.—Sir E. CORNWALL answered: In view of the numerous inquiries received as to the position in insurance of non-manual workers in receipt of war bonuses or other increase in wages bringing their rate of remuneration to over £160 a year the Commissioners felt that the question could no longer be left in uncertainty, and a circular to which my honourable friend refers sets out what the Commissioners are advised to be the legal position in such cases. The difficulty, of which I am fully aware, arises not from the circular but from the general increase in wages. There is no intention at present to introduce amending legislation on the subject.

TUESDAY, OCT. 29TH.

*Medical Services and the Influenza Epidemic.*

Mr. TYSON WILSON asked the Minister of National Service what steps he had taken to provide an adequate medical service for the civil population in view of the present serious epidemic of influenza.—Sir AUCKLAND GEDDES replied: All arrangements made in connexion with the employment of medical men under the Ministry of National Service and all withdrawals of medical men from civil life for service with the armed forces of the Crown during the past year have been made with full regard to the contingency of a widespread epidemic disease affecting the population. Influenza has been more or less prevalent in epidemic form for some months, and the calls on the civil medical profession have been consequently very heavy. Simultaneously, severe fighting on a great scale in all theatres of war has imposed an additional heavy strain on our medical resources. In April Parliament conferred powers on the Minister of National Service which enabled him to examine men of military age at any time. In view of possible emergencies this power was largely used, approximately 7000 medical men being employed and very large numbers of men being examined. Concurrently with the increase of influenza the number of medical men employed on Medical Board work has been reduced, thereby rendering an increasingly large body of medical men available for exclusively civil practice. The number of Medical Board sessions has been reduced from approximately 3500 to 1000 per week. This has not affected recruiting, as the pool formed by examining men in advance has been sufficient to maintain the flow of men to the forces. In order further to reinforce the doctors available to attend the civil population I have given instructions that all medical examinations in advance are to be suspended for the present. Pensions examinations and the examinations of men reporting for service will, of course, continue. Arrangements have also been made to reinforce the medical staffs available at hospitals so far as our resources will permit. In conclusion, I should like to express my deep appreciation of the way in which the medical profession has coöperated with the Ministry of National Service in meeting unprecedented and often conflicting demands for medical personnel.

Mr. PRINGLE: Has the right honourable gentleman any information as to the effect of the influenza epidemic on medical men themselves, and is he prepared to suspend for the present any further calling up of them?—Sir AUCKLAND GEDDES: I have not got any complete figures showing the numbers of medical men who are down with influenza, but I know the numbers have been considerable. We have released from calling upon their time a very large number of medical men who are now devoting the whole of their time to civil practice. We are putting at the disposal of districts where we can full-time medical men. We cannot create medical men for the emergency, but we have to do the best we can to spread the resources we have. It happens that at the moment there is a very heavy demand for young fit doctors for the front. The casualties amongst the medical profession have been very heavy, and we have had to call up a certain number of young fit men because we have nobody else to send to the front. By the front I mean the real fighting line. We have arranged that a certain number of young naval surgeons shall go to France, and they have gone. We are doing our best to have the older and less fit men made available here. The pressure is so great that it is not a simple problem for us to move the men to the place where they are most required.

Mr. PRINGLE: Will the right honourable gentleman secure that no medical practitioner over 40 may be sent out of the country now?—Sir AUCKLAND GEDDES: It would be very difficult to give a pledge, but we are doing the best we can with the resources at our command.

*R.A.M.C. Officers in India.*

Colonel YATE asked the Under Secretary for War what arrangements had now been made for the relief of time-expired Royal Army Medical Corps officers who had been retained in India since the commencement of the war and had had no opportunity for service at the front.—Mr. MACPHERSON answered: Twenty-four officers have been sent to India in relief of a similar number of time-expired, and two are awaiting passage. Until the relieved officers return home it is impossible to spare further officers for the purpose, as the system involves the loss of the services of the officers for a period of two to three months.

*R.A.M.C. Officers, Territorial Force.*

Sir FRANCIS BLAKE asked the Under Secretary for War whether a general promotion list for officers of the Royal Army Medical Corps, Territorial Force, had now been prepared and published; and whether he would state the authorised establishment of colonels, lieutenant-colonels, and majors in that force, and the existing number in each rank.—Mr. MACPHERSON replied: In accordance with

the recommendations of the Committee on Promotion of Officers in the Special Reserve, New Armies, and Territorial Force, a seniority list has been prepared for all officers of the Royal Army Medical Corps, Territorial Force, other than the administrative and *à la suite* staffs of Territorial Force General Hospitals and the Sanitary Service. This list is included in the Army List. The establishment authorised is: colonels 19, lieutenant-colonels 107; and the existing officers of these ranks are colonels 9 and lieutenant colonels 75. Promotion to the rank of major being governed by a time-qualifying period, the establishment of this rank is not limited. The actual promotions consequent upon the determination of the establishments to which I have referred are under consideration and will be published as soon as possible after the receipt of the information which it is essential to obtain from various theatres of war where the officers concerned are serving.

WEDNESDAY, OCT. 30TH.

*The Influenza Epidemic.*

Mr. ROWNTREE asked the President of the Local Government Board whether in view of the continued spread of influenza he would state to the House how many medical advisers there were attached to the Local Government Board, whether they were all at present engaged in giving their whole time to preventive measures dealing with the epidemic, whether in view of the grave results arising from the spread of the disease he considered the staff wanted strengthening, and whether he did not think it advisable to issue broadcast advice as to what steps could be taken by the public to prevent the spread of infection.—Mr. HAYES FISHER replied: The staff of the Medical Department of the Local Government Board consists of a medical officer and four assistant medical officers, together with 20 medical inspectors. A memorandum of instruction as to the preventive measures available, which was prepared by the medical officer, has been issued to every sanitary district in England and Wales, and the sanitary authorities, under the advice of their medical officers of health, are urging the adoption of the preventive measures in their several districts. In the invaded towns information as to the precautions available has been distributed broadcast by means of leaflets, posters, and press notices. In many of these areas day schools and Sunday schools have been closed and the public have been advised to avoid crowded assemblies. In some instances voluntary arrangements have been made for excluding children from cinema performances, and also for increasing the time between performances so as to allow the air in the building to be thoroughly changed. The medical staff of the Board are devoting all such time as is necessary to this epidemic and will continue to do so. I do not at present consider that the staff needs enlargement in consequence of the epidemic.

Answering supplementary questions, Mr. HAYES FISHER expressed the view that the information which it was advisable to bring to the notice of the public was best communicated through the channel of the medical officers of health. He was quite ready to make further inquiries how far this had been effectively done. Conferences had been taking place during the last few days to which the medical officer of the Board of Education had been contributing his wide experience and knowledge. He would give his attention to cases of sanitary districts where there was at present no medical officer of health acting.

Mr. ROWNTREE asked the President of the Board of Education whether in view of the continued spread of influenza he would state what was the view of the Medical Department of the Board regarding the advisability of closing schools at the first appearance of influenza in the school; and whether he thought it desirable to issue some general advice as to what steps could be taken to prevent the spread of infection through the association of so many children.—Mr. HAYES FISHER answered: The closure of schools or the exclusion from school of children suffering from infectious diseases, including influenza, is a matter which rests with the local education authorities or the governors of the schools concerned. Appropriate directions issued by the Board of Education in conjunction with the Local Government Board for the prevention of the spread of infectious diseases occurring among children attending public elementary schools have long been in the hands of all local education authorities and school medical officers. The wisdom or propriety of closure or other action is obviously dependent on the local conditions of the case, upon which it is, of course, impossible for the Board to pronounce. Among such conditions is the degree of prevalence and severity of the disease, as well as the home or other alternative circumstances of the children thus excluded from school. The case of each school must be determined on its merits. It is, of course, essential that all children suffering from catarrhal symptoms, feverishness, or other illness, should at the present juncture be at once excluded, and in many cases it will be found advisable to close the whole school or, at least, departments or classes in the school. As a rule, school closure is more effective in rural districts than in towns. Playgrounds should not remain open when schools are closed. As regards the second part of my honourable friend's question, I have not, up to the present, thought it necessary to issue any general advice of the nature suggested by him. It is obviously impracticable to consider school children separately from other sections of the population which are not within the province of the Board of Education.

Answering Mr. A. WARD respecting a serious epidemic of influenza at the R.A.F. camp at Blandford, Dorset, Major BAIRD (Under Secretary to the Air Ministry) stated that the prevailing influenza epidemic reached the camp on Sept. 21st and had continued to the present date. The number of cases increased in the week ending Oct. 26th, during which 252 cases were reported. Of these 193 were sent to hospital. The number of deaths since Sept. 21st was 59. The average daily strength of the camp was about 15,000. Since the epidemic started five additional doctors and 19 additional nurses had been sent to deal with the situation. For administrative reasons, independent of the epidemic, the drafting of recruits to the camp had been stopped for a period of one week.

# Medical Diary for the ensuing Week.

## SOCIETIES.

**ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W. 1.**

*MEETINGS OF SECTIONS.*

**Wednesday, Nov. 6th.**

OPHTHALMOLOGY (Hon. Secretaries—Leslie Paton, Malcolm Hepburn): at 8.30 P.M.
*Presidential Address:*
Mr. W. T. Holmes Spicer: Changes in the Cornea after Inflammation.
*Papers:*
Dr. J. B. Christopherson and Major Archibald: Nocardia (Lutea) of the Lacrymal Gland.
Major Fenwick: Brittle Bones and Blue Sclerotics.

**Thursday, Nov. 7th.**

OBSTETRICS AND GYNÆCOLOGY (Hon. Secretaries—Comyns Berkeley, J. S. Fairbairn): at 8 P.M.
*Presidential Address:*
Mr. J. D. Malcolm: Develop ments in Abdominal Surgery since 1834.
*Paper:*
Mr. John Adams: The Treatment of Ante-natal and Post natal Syphilis.
Members of other Sections are specially invited to attend.

**Friday, Nov. 8th.**

EPIDEMIOLOGY AND STATE MEDICINE (Hon. Secretaries—William Butler, M. Greenwood): at 5.30 P.M.
*Paper:*
Capt. Hawn, Capt. Hopkins and Capt. Meader (U.S.A. Expeditionary Force): Outbreak of Typhoid fever in Inoculated Soldiers.

RÖNTGEN SOCIETY, at the Royal Society of Arts, 18, John-street, Strand, W.C.
TUESDAY, Nov. 5th.—8.15 P.M., Dr. G. B. Batten: The Presidential Address (illustrated by lantern slides).

## LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.
MONDAY, Nov. 4th.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. D. Armour: Operations. Mr. B. Harman: Diseases of the Eye. Dr. Simson: Diseases of Women.
TUESDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Baldwin: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.
WEDNESDAY.—10 A.M., Dr. Arthur Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations.
THURSDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. D. Armour: Operations. Mr. B. Harman: Diseases of the Eye.
FRIDAY.—10 A.M., Dr. Simson: Gynæcological Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Baldwin: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.
SATURDAY.—10 A.M., Dr. Arthur Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. Mr. B. Harman: Eye Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.
Out-patients each day at 2.30 P.M.

THE THROAT HOSPITAL, Golden-square, W.
MONDAY, Nov. 4th.—5.15 P.M., Special Demonstration of Selected Cases.
THURSDAY.—5.15 P.M., Clinical Lecture.

ROYAL INSTITUTE OF PUBLIC HEALTH, in the Lecture Hall of the Institute, 37, Russell-square, W.C.
Course of Lectures on Public Health Problems under War and After-war Conditions (each Lecture will be followed by a Discussion):—
WEDNESDAY, Nov. 6th.—4 P.M., Lecture V.:—Prof. J. M. Beattie, M.D.: Infection and Disinfection in War Time, especially in Regard to the Present Outbreak of Influenza.

# Appointments.

COOPER, J. S., L.R.C.P. & S. Edin., L.F.P.S. Glasg., has been appointed Certifying Surgeon under the Factory and Workshop Acts for the Clitheroe District of the counties of Lancs. and Yorks.

DESAI, H. M., D.Ch.O. Liverp., Surgical Officer in Charge, Durham County and Sunderland Eye Infirmary.

# Vacancies.

*For further information refer to the advertisement columns.*

*Birkenhead Borough Hospital.*—Jun. H.S. £170.
*Birkenhead Union.*—Sen. and Jun. Res. Asst. M.O's. £350 and £300.
*Birmingham City Sanatorium and Anti-Tuberculosis Centre.*—Jun. Asst. M.O. £350.
*Birmingham, Erdington Infirmary.*—First Asst. M.O. £375.
*Bristol Royal Infirmary.*—H.P. and H.S. £120.
*Cambridge, Addenbrooke's Hospital.*—H.S. £300.
*Chichester, Graylingwell War Hospital.*—Res. M.O. £1 per diem.
*Dagenham (Temporary) Sanatorium.*—Res. M.O. £300.
*Dorchester, Dorset County Council Education Committee.*—School Dentist. £350.
*Edinburgh, Scottish Women's Hospitals.*—Female Asst. M.O. £200.
*French Red Cross, 9, Knightsbridge.*—Dental Surgeons.
*Glamorgan County Asylum, Bridgend.*—Temp. Asst. M.O. £6 6*s.* p.wk.
*Holborn Borough Council.*—M.O. 52 guineas.
*Hospital for Sick Children, Great Ormond-street, W.C.*—H.S. £160.
*Huddersfield County Borough.*—Female Asst. M.O.H. £400.
*Leeds City Infectious Diseases Hospital, Seacroft.*—Asst. M.O. £300.
*Leeds City Public Health Department.*—Female Med. Asst. £400.
*London Temperance Hospital, Hampstead-road, N.W.*—Medical Registrar. 40 guineas.
*Manchester County Asylum, Prestwich.*—Locum Tenens. £7 7*s.* p.wk.
*Manchester Education Committee.*—Two Temp. Asst. M.O's. £400.
*Manchester Northern Hospital for Women and Children, Park-place Cheetham Hill-road.*—H.S. £150.
*Montgomeryshire Education Committee.*—School Dentist. £350.
*Netley, Welsh Military Hospital.*—M.O. £400.
*Norwich, Norfolk and Norwich Hospital.*—H.P. and H.S. £400 each.
*Perth, James Murray's Royal Asylum.*—Phys.-Superintendent. £800.
*Plaistow Fever Hospital.*—Asst. M.O. £300.
*Sheffield, East End Branch of the Children's Hospital.*—H.S. £150.
*Stoke-on-Trent County Borough.*—Temp. Tuberc. Officer. £350.
*Wakefield, Clayton Hospital.*—H.S. £250.
*Western General Dispensary, Marylebone-road, N.W.*—Hon. Oph. S.
*York City.*—Temp. Tuberc. Officer. £500.

# Births, Marriages, and Deaths.

## BIRTHS

ALEXANDER.—On Oct. 26th, at a nursing home in Edinburgh, the wife of R. Charles Alexander, M.B., Ch.B., F.R.C.S.Edin., Major, R.A.M.C., B.E.F., of a son.

BURTON.—On Oct. 23rd, at Princes-gate, S.W., the wife of Major C. F. Burton, M.C., R.A.M.C. (S.R.), of a son.

CLIFF HODGES.—On Oct. 19th, at Brompton-avenue, Liverpool, the wife of Major W. Cliff Hodges, M.D. Camb., R.A.M.C. (T.), of a son.

HENDERSON.—On Oct. 24th, at Brighton, the wife of Major A. T. Henderson, C.A.M.C., of a son.

YOUNG.—On Oct. 15th, to Tina, the wife of W. A. Young, B.Sc., M.B., B.S., Captain, R.A.M.C. (S.R.)—a son.

## MARRIAGES.

GRIFFITH—SORANZO.—On Oct. 28th, at Palazzo Vidoni, Cremona, Italy, Arthur D. Griffith, M.B., B.S., F.R.C.S., Bt. Major, R.A.M.C. (T.F.), to Aurora, daughter of Conte Tomaso Mocenigo Soranzo and the late Principessa De' Soresina Vidoni, of Cremona.

JOSEPH—HOLMAN-HUNT.—On Oct. 22nd, Captain Henry Michael Joseph, M.C., R.A.M.C., to Gladys, only daughter of the late William Holman-Hunt, O.M., and Mrs. Holman-Hunt.

MARSHALL—PHILIP.—On Oct. 26th, at Mather's Hotel, Dundee, Major Geoffrey Marshall, R.A.M.C. (S.R.), to Belle, youngest daughter of George Philip, Dundee.

WALKER—NOSWORTHY.—On Oct. 24th, at Derby, Ernest H. Walker, M.B., Ch.B. (Manchester), to Alice E. Nosworthy, of Torquay. 34, Charnwood-street, Derby.

## DEATHS.

CARTER.—On Oct. 24th, at South Side, Clapham Common, S.W., Robert Brudenell Carter, F.R.C.S., Knight of Justice of the Order of St. John of Jerusalem, late ophthalmic surgeon to St. George's Hospital, aged 90.

DEMETRIADI.—On Oct. 26th, at Southport, Lieutenant-Colonel Louis P. Demetriadi, T.D., R.A.M.C., M.D., F.R.C.S.E., in his fifty-sixth year.

MACKLEY.—On Oct. 29th, Ernest Herbert Alborough Mackley, L.D.S. R.C.S. Eng., of Vermont Dean Park, Bournemouth, aged 46.

PATTEN.—On Oct. 22nd, at Mount Park-road, Ealing, Charles Arthur Patten, L.R.C.P., M.R.C.S., aged 79 years.

SPENSLEY.—On Oct. 23rd, of pneumonia, at the Burdon Military Hospital, Weymouth, Frank Oswald Spensley, Captain, R.A.M.C.

TODD.—On Oct. 13th, at Dordrecht, South Africa, of pneumonia, Dr. C. Gordon Todd (late Captain, South African Medical Corps), younger son of the Rev. James and Mrs. Todd, of Sale, Cheshire.

***N.B.—A fee of 5s. is charged for the insertion of Notices of Births, Marriages, and Deaths.***

# Medical News.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH.—The following candidates have passed the Final Examination and have been granted the diploma L.D.S. R.C.S. Edin.:—

Edward Clive Smith, London; Charles Henry McComb, Belfast; John Sharpe, Piquetberg, South Africa; Albert Donald Barnes, Hereford; and Richard Lisle Eskell, Port Elizabeth, South Africa.

THE Metropolitan Borough of Poplar is supplying, free on application at a number of depôts, electrolytic disinfecting fluid to be used as a mouth-wash and gargle for preventing influenzal infection.

A MEDICAL ASSOCIATION FOR EGYPT.—Hitherto there has been no organisation among medical practitioners in Egypt, and the lack of a representative body has long been felt. A committee has now been appointed to elaborate a scheme for an association or council to look after the interests of the medical profession. The draft project will be submitted to a general meeting of medical men, and if approved by them the Government will be asked to give its formal sanction.

## BOOKS, ETC., RECEIVED.

BAILLIÈRE, TINDALL, AND COX, London.
War Surgery from Firing Line to Base. By Basil Hughes, Temp. Major, R.A.M.C. (T.), and H. S. Banks, Captain, R.A.M.C. (T.), and Others. 30*s.*

CHAPMAN AND HALL, London.
Out of the War? By Mrs. Belloc Lowndes. 7*s.*

CHURCHILL, J. AND A., London.
Text-book of Pharmacology and Therapeutics. By A. R. Cushny, M.D. 7th ed. 18*s.*
Surgery in War. By A. J. Hull, F.R.C.S. Preface by T. H. J. C. Goodwin, Director-General Army Medical Service. 2nd ed. 25*s.*
Diseases of the Eye. By J. H. Parsons, F.R.C.S. 3rd ed. 16*s.*

CONSTABLE AND CO., London.
The Life and Letters of Joseph Black, M.D. By Sir William Ramsay, K.C.B., F.R.S. With an Introduction dealing with the Life and Work of Sir William Ramsay. By F. G. Donnan, F.R.S.
The Future Citizen and his Mother (Chadwick Lectures). By Charles Porter, M.D. 3*s.* 6*d.*

## Communications, Letters, &c., to the Editor have been received from—

A.—Mr. F. W. Alexander, Lond.; Association for Moral and Social Hygiene, Lond.
B.—Capt. J. Brereton-Barry; Mr. J. Best, Lond.; Dr. C. R. Box, Lond.; Mr. J. L. Balderston, Lond.; Mrs. E. M. Bahr, Lond.; Prof. B. Bell, Liverpool; Mr. T. Bennett, St. Albans; Dr. Bishop, Wylam-on-Tyne; Mr. J. C. Buchanan, Lond.; British Waterworks Association Lond.
C.—Mr. S. A. Cowper, Darlington; Messrs. Cassell and Co., Lond.; Dr. S. Chelliah, Colombo; Mr. J. Cabburn, Lond.; Messrs. Clement and Johnson, Lond.; Dr. J. B. Crozier, Lond.; Mr. W. M. Coleman, Harston.
D.—Dr. O. T. Dinnick, Lond.; Dr. H. A. Des Vœux, Lond.; Decimal Association, Lond.; Maj.-Gen. Sir B. Dawson, G.C.V.O., C.B., A.M.S.; Dr. R. Donaldson, Reading.
E.—Mr. D. L. Eadie, Edinburgh; Major R. C. Elmslie, R.A.M.C. (T.)
F.—Dr. C. E. S. Flemming, Bradford-on-Avon; Lt.-Col. N. Falchnie, R.A.M.C.
G.—Prof. E. E. Glynn, Liverpool; Garden Cities and Town Planning Association, Lond.; Lt.-Col. M. H. Gordon, R.A.M.C.; Mr. E. H. Glenny, Lond.; Capt. H. E. Gibson, R.A.M.C.(T.)
H.—Mr. W. H. Harris, Farningham; Dr. A. H. Hogarth, Aylesbury; Mr. V. J. Harding, Montreal.
I.—Incorporated Society of Chiropodists, Lond.
J.—Mrs. J. G. Jack, Kendal; Mr. M. H. Judge, Lond.
K.—Prof. H. Kenwood, C.M.G., Lond.; Mr. R. Kirkland, Wishaw; King Edward's Hospital Fund for London, Hon. Secs. of.
L.—Sir W. Arbuthnot Lane, Bart., C.B., Lond.; Local Government Board, Lond., Medical Officer of.
M.—*Municipal Engineering and the Sanitary Record*, Lond.; Dr. W. C. Morton, Leeds; Medico-Legal Society, Lond.; Capt. A. L. McLean, A.A.M.C.; Mr. G. Mayall Bolton; Medical Research Committee, Lond., Asst. Sec. of; Prof. B. Moore, Lond.; Dr. J. Matthews, Lond.; Lt.-Col. J. N. MacLeod; Sir John W. Moore, Dublin.
N.—National Committee for Relief in Belgium, Lond., Hon. Sec. of; National Hospital for the Paralysed and Epileptic, Lond.
O.—Overseas Military Forces of Canada, Director-General Medical Service of.
P.—Dr. H. R. Prentice, Lond.; Mr. J. J. Perkins, Lond.; Mrs. E. Priestley, Birmingham; Major R. H. Paramore, R.A.M.C.; Mrs. C. W. Pocock, Portishead; Press Bureau, Lond.; Major J. Phillips, R.A.M.C.; Capt. E. Prideaux, R.A.M.C.
R.—Royal Earlswood Institution for Mental Defectives, Red Hill; Capt. E. D. Roberts, R.A.M.C.; Röntgen Society, Lond.; Royal Sanitary Institute, Lond.; Col. R. D. Rudolf, C.A.M.C.; Royal College of Surgeons of England, Lond., Sec. of.
S.—Mr. G. Stoker, C.M.G.; Capt. C. P. Symonds R.A.M.C., Société de Biologie, Paris; Dr. G. B. Shuttleworth, Lond.; Mrs. D. W. Singer, Oxford; Mr. W. G. Spencer, Lond.; Dr. G. de Swietochowski, Lond.
T.—Major G. Taylor, R.A.M.C.; Dr. J. Tatham, Oxted.
V.—Mr. T. Vivian-Rees, Cardiff.
W.—Dr. L. A. Weatherly, Bournemouth; Dr. F. P. Weber, Lond.; West London Medico-Chirurgical Society; Dr. F. J. Waldo, Lond.; Col. A. Webb.
Y.—Mr. M. Yearsley, Lond.

Communications relating to editorial business should be addressed exclusively to The Editor of THE LANCET, 423, Strand, London, W.C. 2.

# Notes, Short Comments, and Answers to Correspondents.

## THE WORK OF THE LONDON PORT SANITARY AUTHORITY.

THE activities of the Sanitary Authority of the Port of London were described by Dr. W. M. Willoughby, medical officer to the port, in a lecture on the Obviation of Ship-borne Infections at the Royal Institute of Public Health on Oct. 23rd. The lecturer prefaced his remarks with a quotation from Gibbon's History which showed that in the reign of Justinian, a time not unfairly comparable with the present, plague was recognised as a ship-borne infection, while the direct infectiousness of the pneumonic form was then appreciated in distinction to the comparative benignity of the bubonic and septicæmic forms. The influence of wars and emigrations on the dispersal of the infection was also known. But it was not, he said, until the concerted work of the Indian Plague Commission from the year 1905 onward showed us the correlation between rodent, flea, and man in the spread of plague that precautionary measures had been effective. Gibbon had remarked that "the wind might diffuse that subtle venom, but unless the atmosphere be previously disposed to its reception the plague would soon expire in the cold or temperate climates of the earth," but the lecturer pointed out that the visitations of the past indicated all too clearly that no reliance was to be placed on the indisposition of England's atmosphere. While the absence of epidemic plague for generations showed the potency of this indisposition as the main factor in our immunity, sanitary measures which did not take the flea and rat into account were incomplete. No poison was more lethal to rats than that of plague, and as the rat population of a vessel was often wiped out during a voyage quarantine had acted as an efficient safeguard against the introduction of the infected rodent. Our immediate ancestors smelt a rat, opened the floor boards and found it, but the present generation was for the most part unfamiliar with the rat, dead or alive. The town-dweller and the rat now lived apart and sweeping epidemics of plague in England were impossible. But dock infections might still occur at points where Eastern trade existed. Prevention consisted in making every storage place for food rat-proof, in removing regularly and rapidly rubbish and discarded foodstuffs, and in a systematic reduction of the number of rats in any district by means of cats, traps, and poison. The inevitable residuum, isolated in small colonies on becoming plague-infected, might be wiped out by the disease without spread of infection. The recent Rat Order of the Ministry of Food had, the lecturer said, followed the correct line in recognising rattiness of premises as a responsibility, monetary and otherwise, of the owner of those premises, and through this Order he hoped that the atmosphere of England might be rendered yet more unreceptive for plague. International agreement laid down certain rules in the case of plague-infected ships, which included the medical inspection of crew and passengers, the disembarkation and isolation of the sick and suspected cases, the disinfection of infected articles and infected quarters, the destruction of rats on board either before or after discharge of cargo, and the observation and surveillance of contents. Dr. Willoughby described the detailed working out of these principles and the special importance of preventing infection by fleas. Other infections were lightly touched upon. In conclusion, the lecturer put forward a plea for a more general education of the public in the rudiments of these relatively simple but fascinating problems.

Dr. G. S. Buchanan spoke of the high degree of efficiency maintained by the London Port Sanitary Authority under circumstances of peculiar difficulty.

## COLONIAL HEALTH REPORT.

*Ashanti.*—The Census of 1911 gave the population as 287,814—141,231 males and 146,583 females—but these figures were admittedly incomplete, and the population has increased since then. The Europeans in 1917 comprised 140 officials, 100 merchants, 122 engaged in the mining industry, and 20 missionaries—total, 382. Coomassie has a population of 24,000, of whom 4000 are described as Ashantis, 4000 as Coast people, 14,000 as North Country people (Hausas, Wangaras, Grunshis, Dagombas, Moshis, &c.), and 2000 as various. The medical report states that the general health of Europeans and natives in 1917 was not so good as in the previous year. There appears to be a steadily increasing tendency for the Ashanti and Hausa elements of the population to come to the Native Hospital for treatment. There was an outbreak of small-pox at Wenchi during the year, which caused 29 deaths out of 164 cases. There was also an epidemic of influenza in Coomassie. Of other diseases the most common were malaria and pulmonary and skin diseases. Of a total number of 140 European officials, with an average of 60 residents, 4 died and 6 were invalided. Among the European non-official population 10 were invalided and 1 died of hæmoglobinuric fever. The sanitation of the towns of Coomassie and Obuasi has been efficiently maintained, if not distinctly improved. A genuine wish for village improvements and the building of better houses is noticeable amongst the Ashantis. The Commissioner of the Western Province writes:—

"The natives of the country thankfully welcomed the visits of the medical officer and his subordinates when engaged in village improvements or employed in prophylactic measures against small-pox, and they brought their children in large numbers to be vaccinated. The alien settlements, however, were suspicious and gave some trouble, particularly the large Wangara population of Wenchi, who are singularly averse to any form of control."

## ROYAL ALBERT INSTITUTION FOR DEFECTIVES, LANCASTER.

IT is refreshing in these days of pecuniary strain to receive the report of a charitable institution which has not to complain of financial stringency owing to the war. We have much satisfaction in congratulating the Central Committee of the Royal Albert Institution, Lancaster, on being able to submit in their recently issued fifty-fourth annual report so encouraging a statement as to their financial position. In the auditor's report the following passage occurs: "In Maintenance Account, it is satisfactory to note increases in donations, annual subscriptions, and payments for patients. Interest on invested funds is also higher." Of course, the committee have again to note a progressive increase in the average cost of maintenance, necessitating an increase of the charge for patients sent by public authorities, but not interfering with that for those paid for by necessitous relatives, for whom the original rates of reduced payments are retained. Altogether during the past 50 years the subscribers have elected 2158 inmates dependent either solely or in great part upon the charitable funds so liberally contributed by all classes of the inhabitants of the northern counties. The report concludes with a grateful acknowledgment of the support received in the past, and an aspiration towards increased progress in the future, adumbrating an "ambitious scheme" of enlargement when restrictions occasioned by the war have passed away.

The report of the Medical Superintendent (Dr. W. H. Coupland) for the year ending June 30th, 1918, records the daily average of patients resident as 732 (486 males and 246 females); 59 had been admitted, 39 discharged, and 19 had died, the mortality percentage having been 2·6 on the average number in residence. Eight out of the 19 had died from some form of tuberculous disease and 3 from epilepsy. The general health had been on the whole satisfactory, notwithstanding rationing restrictions in force.

## PREVENTION OF VENEREAL.

*To the Editor of* THE LANCET.

SIR,—In THE LANCET of Sept. 28th it is stated that in a police-court case, under 40 D, a bacteriologist gave evidence to the effect that his examination was negative. Is it not time the College of Physicians, or the Roy. Soc. of Medicine stated definitely whether the absence of spirochete, or of the gonococus, or the Waserman reaction, decided *absolutely* whether the individual concerned is, or is not suffering from syphilis or gonorea? Many think that the absence of the gonocous is not *evidence* that the individual is cured, or that he or she is non infective, and the same of the Waserman test. It will be a pity if some case come into court when it can be shown that the bacteriological tests can not be relied upon absolutely. Therefore let us have a defenite reliable, and authorative statement.

Liverpool. ROBERT R. RENTOUL.

*** Dr. Rentoul states that he is in favour of phonetic spelling.—ED. L.

## "A MEDIÆVAL MEDICAL AUTHOR."

*To the Editor of* THE LANCET.

SIR,—My attention has just been drawn to your paragraph under this heading in THE LANCET of Sept. 21st. Your correspondent may be interested to know that the French version of John of Burgundy's Tractate is not lost, but exists in the Bibliothèque Nationale, and was published by me in full in the Proceedings of the Royal Society of Medicine, Historical Section, 1916, Vol. IX., page 200. Experts in mediæval French consider, however, that this French version was most probably translated from the Latin, which exists in many MSS. enumerated by me in the same issue of the Proceedings of the Royal Society of Medicine.

On the other hand, the Hebrew text in the Bibliothèque Nationale, Fonds Hébreu MS. 1191, is not a complete translation of the work. It and another Hebrew text, which together do make an almost complete version, have just been published by Mr. Reuben Levy and myself in the "Annals of Medical History," Philadelphia and New York, Vol. I. No. 4.

I am, Sir, yours faithfully,

Oxford, Oct. 25th, 1918. DOROTHEA WABY SINGER.